American Aviation

MANAGEMENT
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MAINTENANCE
EQUIPMENT

MAY 10

1954

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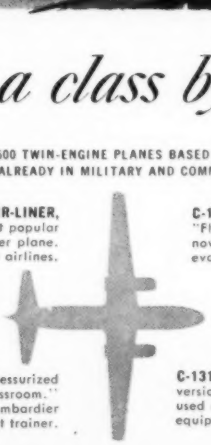
C-131A, Convair "Flying Samaritan" now in service as air evacuation transport.



T-29D, pressurized "Flying Classroom." Navigator-bombardier specialist trainer.

C-131B, still another version of the Convair used as an electronic equipment test bed.

United States Air Force Air Observer Cadets are getting a big lift from Convair's famous T-29 "Flying Classrooms." These multi-place military aircrew trainers are helping to teach the ABC's of air power where it counts the most . . . aloft!

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The T-29 series, like all Convair aircraft, is the result of engineering that aims at the *maximum* of air power . . .

CONVAIR **Engineering to the Nth power**

SAN DIEGO & POMONA, CALIF. · FORT WORTH & DAINGERFIELD, TEXAS

MAY 10,

General tightening of government subsidies for air transportation is the single most prominent theme in the Air Coordinate Committee's aviation poll review submitted to the White House last week.

Results, if program is implemented: Consolidation of trunklines into a more limited number of systems capable of carrying their fair share of uneconomical and developmental service.

Local service airlines, hardest hit by proposals, would have routes adjusted to provide more economic operation and, where significant program toward self sufficiency is not demonstrated, would be terminated. Some key stops would be reassigned to other local service or trunk lines.

Basic poll calls for limiting both amount and duration of government subsidy for new routes at the time route authorization is granted.

Immediate action on establishing a schedule "for the orderly reduction and withdrawal, where appropriate, of air carrier subsidies' support" would issue application of the same general principles to existing routes. When "basic capability for sustained self sufficiency" is achieved, the carrier "should be removed from protection of subsidy eligibility."

Non-scheduled air carriers should be encouraged in bonafide charter and contract operation but "general use" of the exemption authority as a basis of authorizing commercial carrier transportation would be eliminated.

Primary responsibility for safety of design, manufacture, and operation of aircraft would rest with the manufacturer and operator, with government participation limited to spot checking.

Contractor's contribution in building the best equipment at the lowest cost would be considered in negotiating profit margins. Government should reward skill, efficiency and willingness to assume results.

U. S. finance of production would be limited to the degree required to prompt efficient performance of government contracts with this order of preference: (1) private financing, (2) guaranteed loans, (3) progress payments, and (4) advance payments. Exceptions will be possible.

Financing of aeronautical research by the government should be continued and facilities modernized and expanded as necessary. Program should include rotary wings research as part of policy to encourage and support development of commercial helicopters.

Responsibility for development of light planes remains with the industry, but U. S. should support basic research to accelerate development of advanced types.

Simulated airline operations in new type transports should be underwritten by the government but developed with industry funds. Closer coordination between military and civil agencies in designing, testing and approving new transports is urged, including cross representation of military and civil certification boards.

The Washington View

Shake-Up in the Navy

The reorganization of the Navy Department, which is due to be implemented this week, embraces two major changes. The Navy Under Secretary is to be given vastly increased responsibility, and posts will be created for two new assistant secretaries. Under study for some time, the plan received full approval from Defense Secretary Charles Wilson.

Key figure in the reorganization will be the Navy's present Under Secretary, Thomas S. Gates, Jr., charged with the economical business administration of the entire Navy Department. Gates is to assume responsibility for all business and production activities, with principal civilian executives and the seven bureaus accountable to him for total performance.

New Jet Bomber for Russia?

The Soviet Union's display of a four-engine, swept-wing jet bomber in the fly-past over Red Square, Moscow, on May Day, has renewed speculation over the latest Soviet Air Force bomber models. Although the original wire service reports specified jet, a non-technical report could have confused jet with turboprop.

Eight months ago AMERICAN AVIATION sources reported two new turboprop bombers under development behind the Iron Curtain. The Aug. 31, 1953, issue of AMERICAN AVIATION reproduced drawings of two such planes, a straight wing, four-engine bomber and a swept-wing, six-engine bomber.

Rep. Erret Scrivner (R., Kan.), a week ago told the House during debate on the $10.8 billion Air Force budget that the U. S. outnumbers Russia in the air more than three to two.

Scrivner, who heads the Air Force Appropriations subcommittee, also pooh-poohed a recently published picture of a reported new Soviet jet bomber. He said "let me state that responsible intelligence sources informed me that they have valid reasons for believing the picture is not authentic, but is a phoney." The picture was said to be one published in *Aviation Week* (Feb. 15) which was identified as a "Ilyushin 38, swept-wing bomber with four turboprop engines."

McCarran Bill: Not This Year

Sen. John Bricker (R., O.), chairman of the Senate Commerce Committee, has served notice that the committee can not and does not expect to complete action on the McCarran omnibus aviation bill (S. 2647) this year. He has, however, expressed the hope that the current hearings will "build a record that will facilitate the passage of legislation next year."

The need to rewrite the Civil Aeronautics Act is not acute, Senator Bricker says, because he sees no evidence of any impending crisis in the field of air transportation. He did, however, agree with Sen. Pat McCarran (D., Nev.) that "it is better to review basic legislation before it breaks down rather than after."

Last of the Vance Report

In passing the Defense money bill for next year, the House upheld its Appropriations Committee's recommendation that a $250 million carryover for "reserve tools and facilities" revert to the Treasury. The House unit said "other funds appropriated for procurement purposes can be utilized for these items should the need arise."

If the Senate sustains the House action, it will be the last of the so-called Vance Report, which in late 1952 urged the U. S. to stockpile hard-to-get machine tools and plants for use in an emergency.

This report was issued by a group headed by Studebaker chairman Harold S. Vance, and their recommendations were first embodied in the 1954 Truman budget in the form of a request for $500 million for the Defense Department. The 1954 Eisenhower budget retained the $500 million request but Congress cut the amount in half.

None of the money was obligated in the current year but last January the President suggested in his budget message that the $250 million remain available for possible use.

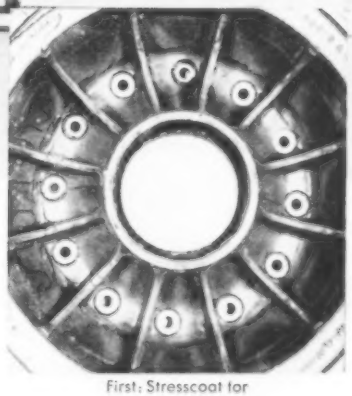
Antitrust, Autos, and Aviation?

An antitrust study of the auto industry by the Justice Department, which was disclosed by Attorney General Herbert Brownell as pending last month, conceivably may develop an aviation aspect. Although aimed at efforts of two auto builders to corner the market, such a suit might eventually involve the relationship of the various divisions supplying aircraft engines and components.

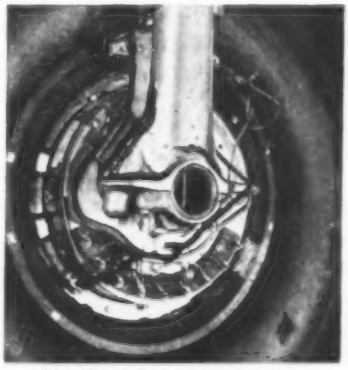
The Justice antitrust move was orginally forecast at Senate Small Business Committee hearings in April. At that time, Assistant Attorney General Stanley Barnes, the Department's "trust buster," said that "we are genuinely concerned about the concentration of production in General Motors and Ford. The Allison Division of GM produces turbojet and turboprop engines of its own design while Buick builds the Wright J65 Sapphire. Ford is involved in production of Pratt & Whitney J57 and R4360 engines. . . . PREBLE STAVER

WHAT LOADS ARE ACTUALLY APPLIED ON LANDING GEARS?

—To Find Out, We "Wired" This Plane For Trouble!



First: Stresscoat for Laboratory Tests



Then: Strain Gauge Instrumentation for Comprehensive Flight Studies

It had never been done before—an extensive *flight-test* study in which simultaneous recordings were made of all the component landing-gear loads affecting wheels and brakes, together with the resulting strain.

We selected our own Twin Beech as the guinea pig, and ultimately put it through every conceivable type of field maneuver during the course of 64 flights — *with strain gauge instrumentation of the gear at 135 points.*

But first, Stresscoat was used to tell us where to locate strain gauges. Then, to segregate loads the instrumented strut assembly was subjected to extreme conditions of drag, side, radial, and castering loads on special laboratory test equipment.

The results have proved the dependability of laboratory testing and have enabled us to go further, for they have opened up new knowledge concerning true service loads which was hitherto unknown.

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OTHER PUBLICATIONS . . .

American Aviation Daily, a daily news service for the entire industry, $200 per year. Managing Editor: Keith Saunders.

American Aviation Directory: twice yearly listing of products, people and organizations, $7.50 each. Managing Editor: Marion E. Gran-bow.

Official Airline Guide: Monthly publication of airline schedules and fares, $13.50 per year in USA; $14.00 in Canada; $15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

Air Traffic News (incorporating Air Tariff Reports): Daily rates and tariff news, $175 per year, Managing Editor: Wallace I. Longstreth.

When & Where

May 10-12—Inst. Radio Engineers, Nat'l Conference on Airborne Electronics, Dayton Biltmore Hotel, Dayton, O.

May 16-19—American Assn. of Airport Executives, annual mtg., Kentucky Hotel, Louisville, Ky.

May 17-18—Nat'l Fire Protection Assn., Aviation Seminar, Statler Hotel, Washington, D. C.

May 20—Women's Nat'l Aeronautics Assn. Skylady Derby, Raton, N. M., to Kansas City, Mo.

May 20-21—Armed Forces Chemical Assn., Washington, D. C. Hosts: U. S. Air Force.

May 21-23—Texas Private Fliers Assn., state convention, Galvez Hotel, Galveston, Tex.

May 25-26—ATA, Public Affairs Committee, Brown Palace Hotel, Denver.

May 26-28—ATA, airline finance & accounting committee, Key Biscayne Hotel, Miami.

June 1-5—Nat'l Convention of Flying Farmers, Yosemite Nat'l Park, Calif.

June 5—Reading Aviation Service, 5th annual Maintenance & Operations Clinic, Reading Municipal Airport, Reading, Pa.

June 7-9—AFL-Machinists, 3d Aircraft & Guided Missiles Conference, Atlanta, Ga.

June 7-10—Society of Plastics Industry, 9th Nat'l Exposition, Cleveland, O.

June 9-11—American Society for Quality Control, 8th Annual Convention, Jefferson Hotel, St. Louis.

June 20-23—Aviation Distributors & Manufacturers Assn., mid-year mtg., Stanley Hotel, Estes Park, Colo.

June 21-24—Inst. of the Aeronautical Sciences, summer mtg., Los Angeles.

June 24-26—American Helicopter Society, 10th annual forum, Mayflower Hotel, Washington, D. C.

June 29-July 2—University Aviation Assn. summer meeting, Hotel Fontenelle, Omaha, Neb.

Oct. 3-5—Champion Spark Plug, 10th annual meeting, Hotel Secor, Toledo, Ohio.

INTERNATIONAL

May 11—ICAO Special Communications mtg., Middle East region, Rhodes.

May 31-June 11—Canadian International Trade Fair and National Air Show, Toronto.

June 1—ICAO Assembly, 8th session, Montreal.

June 15—ICAO Meteorological Division, 6th session, Montreal.

June 18-19—British National Air Rally, Baginton Airport, Coventry, Britain.

Sept. 7-12—Society of British Aircraft Constructors, Aircraft Show & Flying Display, Farnborough, England.

Sept. 13-17—IATA, 10th Annual Meeting, Paris.

Sept. 20-29—Federation Aeronautique Internationale general meeting, Istanbul, Turkey.

Sept. 21—IATA, Traffic Conferences, Italy.

Oct. 5—ICAO, air navigation meeting for the North Atlantic region, Montreal.

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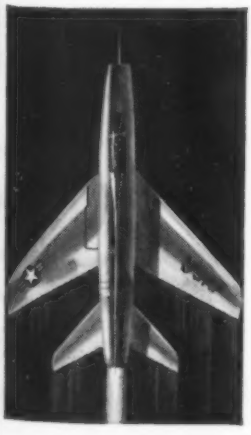
MACH BUSTER!

First of the true tri-sonic fighters, the new F-100 Super Sabre exceeds Mach 1 in normal, level flight . . . flying faster than the speed of sound.



MACH (pronounced "mock") is a term you'll be seeing more and more since it is the only really accurate way of evaluating jet plane speeds. The need for this special standard of measurement is due to the fact that the speed of sound varies with changes in temperature and altitude. At sea level, for instance, sound travels at speeds ranging from 760.9 M P H at an air temperature of 60° to 790.7 M P H at 100°. However, using the Mach numbers, a jet traveling at Mach 1 is flying at the speed of sound, no matter at what altitude or temperature. Far advanced beyond any fighter now in production, the F-100 Super Sabre was designed and built by North American to meet our nation's need.

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Uneven driving forces during rivet installation can crack skin panels. Rework is costly.

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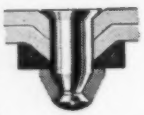

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Letters

Letters should be addressed to The Editor, American Aviation Magazine, 1025 Vermont Ave., N. W., Washington 5, D. C. Anonymous letters will not be printed, but names will be withheld upon request.

FORTITUDE

To the Editor:

Congratulations on the editorial "Mail for the Locals" in the issue of March 29. I have been wondering when there would be someone come out with at least part of the truth on the mail pay which is paid to the railroads. I have never been able to understand why the airlines, trunk and local, sit and take all accusations regarding mail subsidy that are handed to them when they must have the facts in the matter before them all the time.

Perhaps now that you have had the fortitude to bring this out into the open, someone in the industry will have enough to follow through on the matter.

WALTER W. FELL,
Manager
Paso Robles Airport
Paso Robles, California

•

USAF SAFETY

To the Editor:

I have just read . . . the story prepared by Mr. Walter Kilrain, of your organization, entitled "USAF Major Accident Rate Hits New Low" (AMERICAN AVIATION, March 31).

Please accept my thanks for the fine story. I appreciate your interest in this organization and I am particularly pleased with the manner in which Mr. Kilrain presented the material. The story reflects a great deal of comprehension on the part of the author in portraying the activities of this organization, and his is one of the best press presentations I have seen in this regard. I would appreciate your conveying my thanks and congratulations to Mr. Kilrain.

Thank you very much for the splendid story and for your consideration in presenting the information to your many readers.

VICTOR E. BERTRANDIAS
Major General, U. S. Air Force
Office of The Inspector General
Norton Air Force Base
San Bernardino, California

•

CANADIAN FEES

To the Editor:

The purpose of this letter is to argue with you on the implied conclusion in your article regarding the Canadian airport fee structure in the February 1 issue.

I have heard comments regarding this article from different sources, and none are too happy because the article seems to overlook the effect of the fact that the Canadian airports are owned by the Dominion of Canada. As a result, standardized airport rates work in the same manner that standardized air carrier rates work, as outlined by Wayne McMillan and Wayne Parrish in his editorial commenting on McMillan's comments. Standardized rates work only to the extent that there is uniformity of ownership and management.

Some years ago, various trade associations considered the possibility of standardized rates and found that they wouldn't work in the United States in view of the widespread ownership of airport facilities.

LEIGH FISHER
Leigh Fisher & Associates
P. O. Box 1168
South Bend 24, Indiana

(Mr. Fisher, who heads a firm of airport analysts and counsellors, is correct about the reason for Canada's success. As the article noted: "This has been made possible to a great extent by the fact that the majority of the fields are operated by the federal government's Department of Transport. Of about 300 civilian airports, about 115 are federally operated, 100 are run by municipalities, and about 35 are run by airlines. Provincial air services and the department of mines each operate about 25."—Ed.)

•

REPORT TO COMMERCE

To the Editor:

Just a note to say that was a fine article by Henzey in the March 1 magazine on CAB's report to Commerce.

HAROLD RUSSELL
Suite 825, The Citizens & Southern
National Bank Bldg.
Atlanta 3, Georgia

•

DRAGNET

To the Editor:

You may be interested to know that since the item in Airline Commentator concerning my "Dragnet" sales skit at the recent Delta-C&S sales conference I have received 41 requests for the material, as far west as Hawaii and as far east as England.

K. J. HOWE
District Sales Manager
Delta-C&S Air Lines
Houston, Tex.

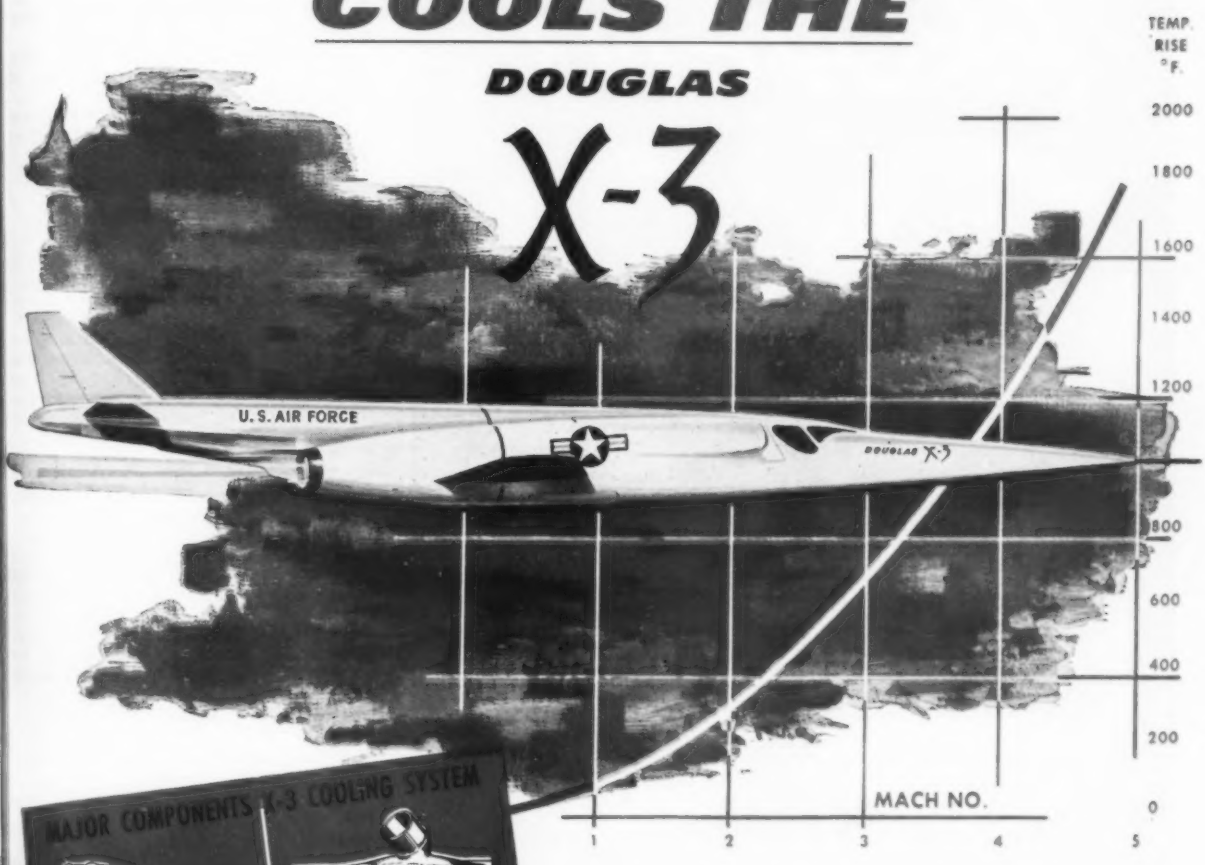
•

APPRECIATION

To the Editor:

I would like to take this opportunity to express our sincere appreciation for the very fine article written by Lois C. Philmus about the Fixed Base Division

STRATOS COOLS THE DOUGLAS X-3



MAJOR COMPONENTS X-3 COOLING SYSTEM
BLOWER HEAT EXCHANGER
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100 LB/MIN AIR CYCLE REFRIGERATION TURBINE
WATER EVAPORATOR

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Stratos is proud to have been called on to design and produce equipment for this radical new research airplane built under the joint sponsorship of the Air Force, the National Advisory Committee for Aeronautics and the Navy.

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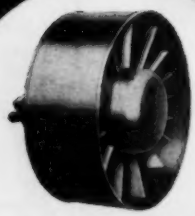
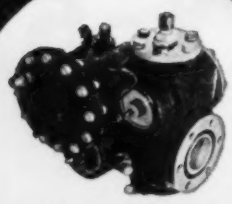
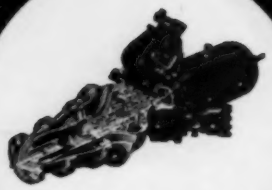


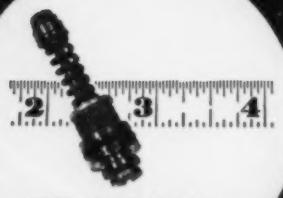
EMERGENCY POWER TURBINE



ENGINE POWER CONTROL



AUXILIARY POWER TURBINE



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THE WEST'S LARGEST JET ENGINE RESEARCH AND DEVELOPMENT CENTER

of Piedmont Aviation, Inc. We have had a great many comments on this article from our friends in the industry and we certainly appreciate her taking the time to prepare such a factual article, and would appreciate your extending our appreciation to the other staff members of your magazine.

We would like very much to receive reprints of the article in quantities of approximately 200.

R. S. NORTHINGTON
Vice President

Piedmont Aviation, Inc.
Smith Reynolds Airport
Winston-Salem 1, N. C.

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FINE COVERAGE

To the Editor:

This is to express our appreciation to AMERICAN AVIATION for the fine coverage given in the March 29 issue to our General Report No. 1 on electron tube reliability in military equipment. Your very well written article effectively presents the salient features of the report.

For your information, we wish to call attention to two minor points: (1) In the sixth paragraph, it would be more accurate to say in the concluding sentence that "Only one of the six actually causes *catastrophic, or unpredictable,* equipment failure." (2) The tube returns from Norfolk, referred to in the third column of the article under the heading "Norfolk Naval Air Station" are actually from ship equipments as well as airborne gear. For convenience, we usually refer to our Norfolk field station as being at the "Norfolk Naval Base."

Thank you, again, for the good job on our report.

CHARLES J. HEDETNIEMI

Military Contract Division
Aeronautical Radio, Inc.
1520 New Hampshire Avenue, N. W.
Washington 6, D. C.

Books

AVIATION DICTIONARY, GERMAN-ENGLISH, ENGLISH-GERMAN *by Roderich Cescotti, published by Hanns Reich Verlag, 8 Martin Strasse, Munich 23, Germany. Price $3.30. 448 pages.*

Containing over 30,000 terms in aviation and kindred subjects, this is a much needed, up-to-date work for those who have to translate from German into English and vice versa. It contains a list of abbreviations (including those used by ICAO and the USAF) and standard basic R/T phraseology for GCA procedures.

THE AEROPLANE DIRECTORY OF BRITISH AVIATION, 1954 EDITION, *published by Temple Press, Bowling Green Lane, London E.C.1. Price 21 shillings ($2.95). 545 pages.*

This valuable reference work for the United Kingdom and the entire British Commonwealth now features guide cards with thumb tabs, enabling the various sections to be identified instantaneously. The biographical section of the directory includes material on over 1600 aviation personalities.

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EDITORIAL

What About the Rest?

A GREAT DEAL has been written about A-bombs and H-bombs being deterrents against war. We concur that the H-bomb has very possibly, or even probably, brought an end to *total* war so long as major adversaries are able to blow each other to smithereens. But neither A-bombs nor H-bombs have become a deterrent to Korea and Indo-China types of war. Nor have they deterred the U.S.S.R. from continuing to make gains. When a straight run is blocked, there is always an end run to be tried. Air power is needed not only to block a *total* war but to meet the needs of all other types of conflict. The answer to these smaller wars and Soviet expansion hasn't been found yet. It's about time we awakened to this fact and stopped thinking the H-bomb is a total answer.

by W. W. P.

U. S. vs. Europe

CONSIDERING the very wide spread of commercial aviation around the world it is easy to assume that the problems of equipment, economics, air traffic control, and the like are pretty much the same in one area as in another.

Reports for 1953, however, point up the vast divergence of these problems. Lack of appreciation for these differences has often resulted in misunderstanding as to equipment and other requirements. Commercial aviation got a head start in Europe in the 1920's, but since World War II, especially, the U. S. has gone so far into the lead in terms of air traffic and low fares that the problems of Europe and the U. S. have grown apart.

Here are two illustrations of these differences:

Traffic Control

It is difficult for aviation experts outside the U. S. to understand the terrific airport traffic problems faced by our major cities and to realize that these problems have an important bearing on the introduction of turbojet and other new types of equipment.

Last year Chicago Midway Airport had 266,825 air carrier movements on a single field. The busiest city in Europe, London, with two airports, reported a total of 92,272 air carrier movements. Paris, with two airports, reported 54,532. Amsterdam had 30,116 and Copenhagen 29,238. New York, with three airports serving passenger-carrying lines, reported a combined total of 364,000 air carrier movements. Los Angeles had 138,738 and Miami 110,515.

London's two airports were on a par with the single airport of Oakland, Calif., which had 84,307, while Paris was comparable to Denver, which had 55,569. Copenhagen has always been an important air transport center, yet Akron, O., and Albany, N. Y., each had a like number of air carrier movements.

When it comes to total plane movements, Chicago's 331,338 movements at a single airport tops London's 106,408 at two airports by a wide margin. In terms of total movements Amsterdam is comparable to Peoria, Ill., Medford, Ore., and Boise, Idaho.

This is not being written for purposes of boasting, but to point up the wide divergence of air traffic problems which inevitably have a bearing on transport equipment, communication, and traffic procedure. Chicago's average of more than 900 airplane movements daily, of which over 700 are air carrier, is a symbol not only of progress but a traffic control challenge which the pioneers of aviation never dreamed about.

Seat-Mile Costs

Only in the U. S. and in Australia are air fares really low. In Europe tourist fares are often higher than first class fares in the U. S., and very often on long-haul routes leading from Europe to Africa and Asia the first class fares are double or close to double the first class fares in the U. S.

This differential has a vital bearing on whether a particular type of airplane makes or loses money.

A 40-passenger airplane collecting 11¢ per seat-mile on the South African route may be nicely profitable. But on the New York-Miami route where the first class fare is 7¢ a mile (and 4¢ for air tourist) the same airplane might well produce nothing but losses.

An airline flying 50 first-class passengers between Paris and Rome collects 9.7¢ per mile per passenger or a total of $3,360 for the trip. But an operator flying the comparable distance between New York and Chicago charges 6.2¢ a mile first class and thus collects only $2255, almost a third less.

An especially good illustration is New York-Washington and London-Paris with almost identical mileages. The former route carries a 6.7¢ first class fare and a 5.2¢ tourist fare. The latter carries a 10.9¢ first class fare and an 8.6¢ tourist fare. Thus a 40-passenger tourist load produces $780 for a London-Paris flight while the American route produces only $444.

An air tourist (or coach) passenger pays 4¢ a mile to fly from Los Angeles to San Francisco or from Los Angeles to New York. But he pays 10.5¢ a mile for an air tourist seat from London to Brussels and 8.7¢ per mile for a seat from London to Cairo. The spread is very great.

So it is that a particular airplane that turns a handsome profit on a route in Europe might be disastrously outpaced on a route in the U. S. That is why the American manufacturers have had to pay extreme attention to operating economics. The U. S. market, especially, has become highly competitive and air fares are competitive with ground transport.

. . . WAYNE W. PARRISH

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Industry Spotlight

• Continental Aviation & Engineering Corp. will build jet engines (pr sumably J69 Marbore engines) for pilotless drones under the terms of a $2 milli USAF contract. Current versions of the Ryan Firebee are powered by Fairchi J44 engines.

• Securities Exchange Commission has filed suit against the Horton Ai craft Corp. for selling stock without registration and making untrue statemen about their product to stock purchasers. SEC termed Horton's wingless airpla "A converted, obsolete, and conventional aircraft with certain Horton modifi tions which have destroyed its airworthiness and that it does not represent m achievement or advance in aviation; that it is unsafe, completely unfit for co mercial purpose, and can barely sustain flight . . ."

• Flight of Convair's YC-131 Turboliner, powered by two Allison YT56-A engines, is scheduled this month, following inspection by the Air Force contra compliance board.

• More than 50,000 in-flight refuelings have now been logged by the U. Air Force.

• About 75% of all electron tube functions in a medium military bomb could be handled by transistors, according to a recent estimate by W. H. Forst Philco Corp. executive engineer, at the recent Radio Technical Commission f Aeronautics spring session. Forster also sees nothing preventing eventual produ tion of transistors cheaper than today's 57-cent vacuum tube and lasting 70,0 hours in service.

• Airborne radar equipment program reportedly under consideration United Air Lines management would take in all fleets of aircraft and approx a $5 million expenditure. Cost of radar is estimated by UAL at about $13,5 and aircraft modification and installation an added $7000 to $10,000.

• New concept in electronic pilot training devices originated by Americ Airlines and reportedly gaining favor with other operators would simulate cockpit procedures except those of actual piloting. Emphasis would be plac on emergency functions. AA has asked bids from training equipment man facturers based on its requirement for 16 units and anticipates unit costs abo 10% those of full flight simulators.

• National Aeronautical Corp. has reached one-a-day production of civil distance measuring equipment, with a current backlog at $50,000. Narco h received firm orders for its first production run of 100 units and is now planni its second run requirements.

• Latest proposal for a 50-passenger transport convertiplane by E. Bur Wilford's Pennsylvania Aircraft Syndicate is a modified Convair 240 with clipp wings, twin vertical stabilizers, turboprop engines, and a 100 ft. diameter pressur jet-driven rotor. Specification calls for a gross weight of 50,000 pounds, cru speed of 250 knots, and vertical take-off and landing under power.

• Disclosure by Curtiss Wright Corp., Wright Aero Division, of past test of some 70 thrust reversal designs (see story page 20) points to high level activ among U. S. engine manufacturers in this field, despite previous lack of in indication. Feeling prevails among engine producers that thrust reversers shou be developed and built by them, rather than by aircraft or accessory firms, assure best matching of unit to a particular engine design.

• Bendix Aviation Corp., Red Bank Division, has started production a new heat-resistant electron tube using a special Nonex hard-glass envelope. is designed to operate at a bulb temperature of 572° F. for a minimum of 1 hours compared with 356° F. and much shorter life span of many present tub

• Kollsman Instrument Corp. has developed a jet engine pressure ra indicator which will give a continuous cockpit reading of tail pipe to in pressure ratio for determining most efficient power settings.

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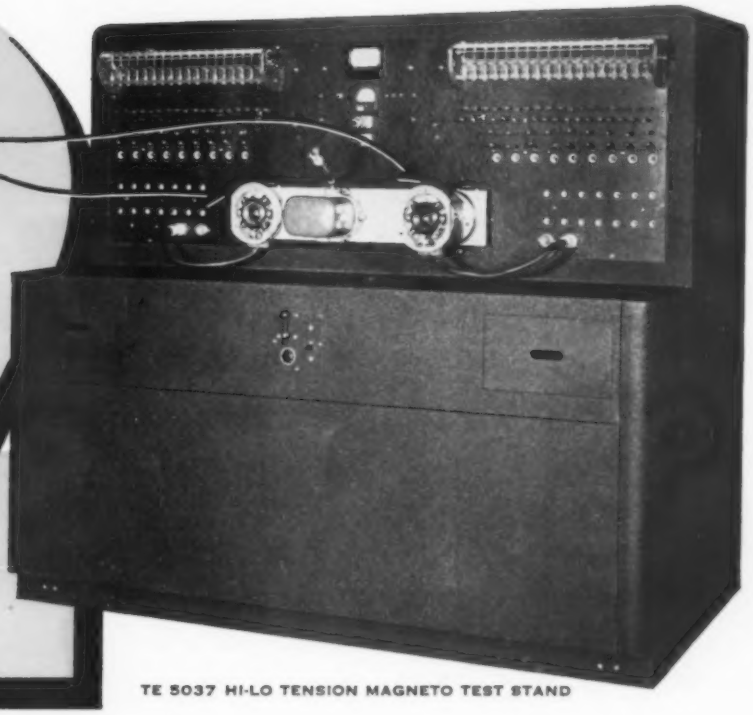

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RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

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"TWO YEARS of service proves the new B. F. Goodrich Dimpled Tire gives 20% more landings than all others," reports Northwest Orient Airlines. That's one reason why economy-minded Northwest officials have made the Dimpled Tire standard equipment on all DC-4's and Stratocruisers.

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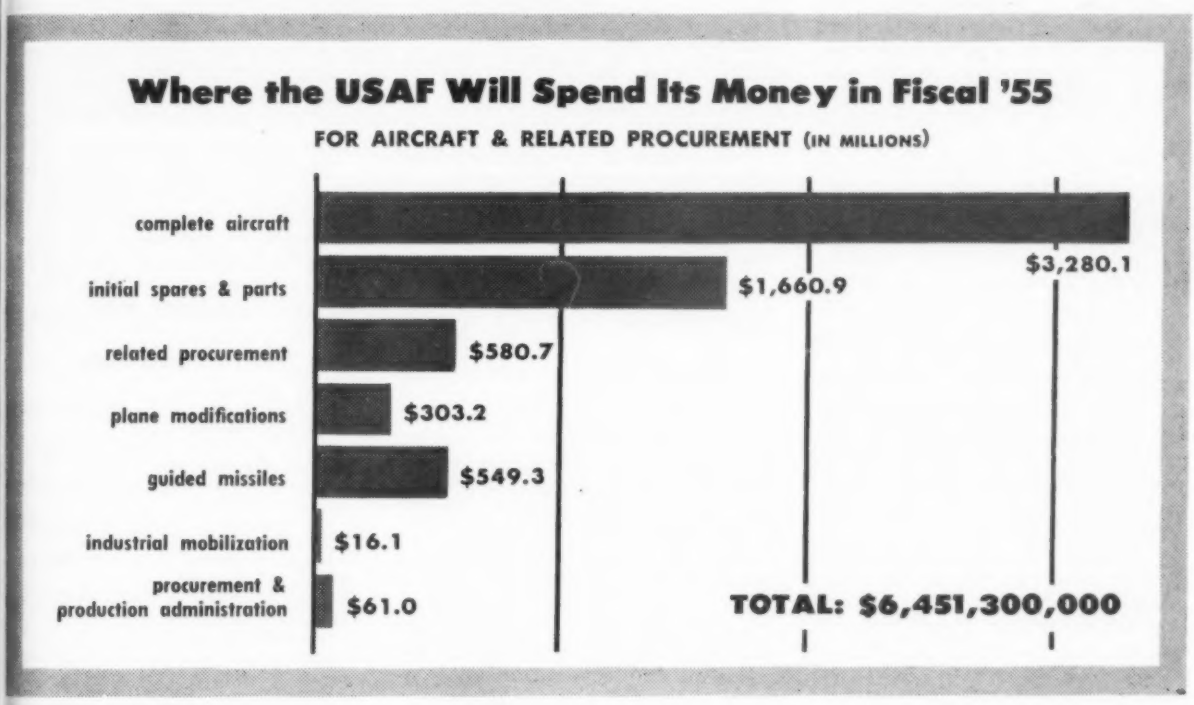


AF Will Have $6.5 Billion to Spend in '55

Total is increased by enlarged carryover; $2.8 billion in new money voted by the House.

By Robert M. Loebelson

WITH House passage of a slightly reduced Defense money bill for fiscal 1955 completed, and with Senate concurrence virtually assured, it became possible last week to evaluate just what the aircraft industry could expect in the way of new orders for the year beginning July 1.

It was certain that more money would be obligated in fiscal 1955 than had been anticipated when the budget message was submitted in January. The added orders would be the direct result of the Air Force's current policy of placing orders slowly. When the budget was sent up to Capitol Hill, the USAF expected to carry over $1,899,183,000 of 1954 money. But the lag in obligations leads the AF to expect that $3,691,333,000 will now be carried forward for aircraft and related procurement.

Thus instead of the $4,405,000,000 projected in the budget for USAF plane buying, the figure has now risen to $6,451,300,000 (see chart). The budget message anticipated $2,360 million for complete aircraft, $1,037 million for initial spares, $282 million for related procurement, $180 million for aircraft modifications, $470 million for missiles, $15 million for industrial mobilization, and $61 million for procurement and production administration.

Unfortunately, the published USAF House Appropriations Subcommittee hearings are based on the assumption of $1.9 billion in carryover funds for plane purchases and $2.76 billion in new money. The changeover to $3.7 billion in carryover will naturally scale up orders placed in 1955.

However, it still provides a graphic view of orders to be placed, even though the money to be obligated is greater in almost every case.

In any event, this is how the House hearings show the Air Force planned to obligate its aircraft and related procurement money before the 1954 lag in obligations took place:

• **Project 110** (see table, page 14) calls for the placement of $2,360,000,000 to finance the planned production of 1167 aircraft. Types and quantities of

On the Cover

Military spending is a complex structure of money available (appropriated), spent (paid for aircraft completed), obligated (under contract), and unobligated.

As of March 1, according to the Defense Dept., $17.3 billion of the $38.3 billion available for USAF aircraft since fiscal 1951 remained unspent, $8.9 billion (including fiscal '55 funds), unobligated. Navy figures are also shown on the cover.

each model to be ordered were given in secret testimony.

• **Project 120** involves $1,037,000,000 for initial aircraft component spares and spare parts. Included are airframe spares ($33,440,000), spare engines and engine spare parts ($13,971,012), armament spares (amount not given), airborne electronic spares (amount not given), airborne weapons (amount not given), and other Government-furnished aircraft equipment, e.g., 48 items ranging from main wheels, brakes, nose wheels, generators, air starters, and gyro controls to airspeed and altitude indicators, ($2,788,884).

• **Project 130** anticipates the placement of $282 million in orders for Related Aircraft Procurement. Under this category are $45 million for industrial machinery, equipment, and facilities, $18 million for training items, $65 million for aircraft ground handling equipment, $114 million for pre-production costs, and $40 million for service test materiel.

Of the $114 million scheduled under this Project 130 heading for pre-production costs, $99 million will be used to implement production of one airplane, one engine, and four major electronic components.

• **Project 140** involves $180 million for modification of both combat (those that will stay in active service one year after the changes are made) and non-combat (those that will be in the active inventory for at least two years) aircraft. Modifications scheduled and the types of planes involved were cited in secret testimony.

• **Project 150,** which schedules $470 million for guided missiles, is divided as follows: complete missiles ($303,447,000), initial component spares and spare parts ($23,454,000), preproduction planning and facilities ($61,082,000), modification and modernization of missiles ($10,563,000), and auxiliary equipment ($71,454,000).

• **Project 180,** $15 million for industrial mobilization, entails $3,436,000 to maintain 12 plants in the Air Force Industrial Reserve, $8,898,000 to buy, transport, store and issue reserve machine tools and production equipment, $2,005,000 for studies relating to the industry preparedness program (how to make the transition from peacetime to a wartime basis), and $661,000 for industrial mobilization (salaries of civilians and travel pay for officers and civilians in the industrial mobilization program).

• **Project 190** is concerned with $61 million for procurement and production administration. The money principally covers civilian salaries for the industrial auditing and procurement and production functions of the USAF's procurement program.

Following is the breakdown of the $3,691,333,000 to be carried over and the $2,760,000,000 voted by the House:

Available for AF Obligation

[Millions of dollars]

Project No.		Unobligated balance brought forward July 1, 1954	Fiscal year 1955 new appropriation
110	Aircraft Complete	$1,283.3	$1,996.8
120	Initial Aircraft Component Spares and Spare Parts	1,485.0	175.9
130	Related Aircraft Procurement	476.7	104.0
140	Modification of In-Service Aircraft and Component Equipment	161.0	142.2
150	Guided Missiles—Complete	284.2	265.1
180	Industrial Mobilization	1.1	15.0
190	Procurement and Production Administration	.....	61.0
	Total	3,691.3	2,760.0

As far as aircraft and related procurement for the Navy's Bureau of Aeronautics is concerned, the House-approved measure grants $1,973,568,000 in new money, or a reduction of $13,432,000 from the $1,987,000,000 requested in the January budget. The reduction involves an amount equal to the unobligated portion of prior year funds for expanding plant facilities for guided missile production, according to the recommendation of the House Appropriations Committee.

The $1,987 million sought broke down as follows: $1,880,000,000 for Project 1, aircraft procurement, $60,000,000 for Project 2, guided missile and target drone procurement, $6,800,000 for Project 3, technical equipment for service training, and $40,200,000 for Project 4, aircraft modernization.

• **Project 1** is divided into four categories, but new money is sought for only two for the coming year. A total of $1,253,000,000 is asked for flyaway airplanes and $627 million is allocated for spares. No new money was asked for "acquisition of aircraft production equipment" (no prior year money will carry over) or for "augmentation of petroleum facilities" (about $6.5 million will carry over).

• **Project 2** involves $45 million in orders for missiles and $15 million to buy target drones. No money was asked for "plant facilities for missile production" because Navy officials said they still had $13,432,000 for this purpose carrying over from fiscal 1953. (It was this sum that the House deleted.)

• **Project 3** seeks $6,800,000 for six categories of training items: airframe components, power plants, armament, electronics, instruments, and mechanical.

• **Project 4** calls for $26,243,500 for modernizing aircraft and $13,957,000 for modernizing equipment. Of the former, $16 million would be used to convert transports, $7.9 million to convert training planes, and $2.4 million to update missile controls and target drones.

All in all, therefore, the Navy's BuAer thus expects to place orders for aircraft and related equipment totalling $1,973,568,000 with its new money and estimates that it will have a total carryover of $260 million more from previous years. Total available for obligation will be $2,236,568,000 for aircraft and related procurement.

The Navy's other major aviation budget activity is "Aircraft and Facilities." Where the budget called for $971,100,000 in this field, the House voted $775,895,500, or $195,204,500 less.

This, however, was how BuAer planned to obligate the $971.1 million:

BuAer Spending

Flight operations, Regular Navy	$203,347,000
Flight operations, Naval Reserve	20,201,000
Aircraft overhaul, Regular Navy	171,995,000
Aircraft overhaul, Naval Reserve	39,883,000
Station operations, Regular Navy	182,000,000
Station operations, Naval Reserve	10,853,000
Alteration and replacement of facilities	57,066,000
Research and development	147,149,000
Industrial mobilization	5,618,000
Guided missile outfitting	10,000,000
Supporting equipment, materiel, and services	116,191,000
Departmental administration	6,797,000
Total obligations from appropriated funds	$971,100,000

In summation, then, this is what the aircraft, engine, propeller, and parts industry can expect in the way of new orders in fiscal 1955:

Overall New Orders

USAF Aircraft and Related Procurement		
	New Money	$2,760,000,000
	Carryover	3,691,333,000
	Total AF	$6,451,333,000
Navy Aircraft and Related Procurement		
	New Money	$1,973,568,000
	Carryover	260,000,000
	Total	$2,233,568,000
Navy Aircraft and Facilities		
	New Money	$ 775,895,500
	Carryover	57,220,000
	Total	$ 833,115,500
Grand Total		$9,518,016,500

Connie with turboprop. The first Constellation ever built, "Old 1961," takes off from Burbank in the start of a test program on the T56 engines that will power Lockheed's forthcoming C-130 cargo transport. Built in 1943, the aircraft has been used extensively for flight testing. The T56 is at far left in photo.

Progress Payment Policy Order Revised

A new directive dealing with progress payments for the aircraft industry has been issued by the Department of Defense. Designated No. 7840.1, it cancels an earlier directive of the same number which was dated February 15, 1954.

The new directive assures the industry that it will continue to receive progress payments based on costs, as has been customary in the past. Long-lead-time items, such as aircraft, engines, and electronics equipment, will be exempted from the provisions of the earlier directive which stated that "it should seldom be necessary for progress payments based on costs to exceed 90% of direct labor and material costs, or 75% of total costs, of the work done under the undelivered portion of the contract."

Under the terms of this early directive, any arrangement other than that specified would be considered "unusual" and the manufacturer would be obliged to demonstrate "actual reasonable need for progress payment." The manufacturers of long-lead-time items will not be required to make such demonstrations, according to the revised directive.

To minimize administrative work, progress payments will be discouraged on relatively small contracts (under $1 million) held by large firms, unless the combination of several such contracts would have considerable impact on working funds.

Standard rates for liquidation of payments are provided, so that the contractor who receives 75% of all costs, as progress payments, will receive no more than 25% of the contract price of items as they are delivered, until his progress payments have been recovered from the contract price of delivered units.

Approach Radar Plan May Be Slowed by CAA

A slow-down of the installation of ASR and PAR radar equipment is under consideration, CAA Administrator Fred B. Lee has revealed, and the Air Coordinating Committee's NAV panel has submitted the proposal for industry comment.

The cutback would come through a revision of the airway planning standard that applies to such equipment. "The new standard," Lee declared, ". . . will consider an ASR justified when an approach control tower handles 3000 or more instrument approaches annually. This has the effect of reducing our program for additional ASR's from 40 to 12."

Revised requirement for PAR calls for its installation where 2000 or more instrument approaches are made annually, cutting the program from 32 to three.

During fiscal 1955, five new ASR and eight new PAR systems will be placed in operation, adding to present totals of 26 and 10, respectively.

Babb Moves Offices

The headquarters of the Babb Co., Inc., which now has offices in Newark, Glendale, and Seattle, will be moved to Phoenix, Ariz., where a $1.5 million plant will begin to be built within the next two months. The firm, a wholly owned subsidiary of the Atlas Corp. deals in aircraft sales, service, and supplies.

Marquardt Reveals New Jet Engine Reverser

A variable area jet engine nozzle that will provide up to 35% reverse thrust, meet requirements for maximum engine thrust on take-off regardless of temperature, and provide for water-alcohol injection has been developed by Marquardt Aircraft Co.

Positive control of forward thrust regardless of engine rpm's is offered by the device, which will be ready for tests soon, according to Marquardt president Roy E. Marquardt. In flight it will trim the area of the exhaust to achieve minimum fuel consumption for a given thrust. The resulting savings in fuel will more than compensate for the weight of the device (under 100 pounds) in the opinion of Marquardt engineers.

ACC Working Group Proposes Review Items

A series of subjects have been proposed by the "working group" level in the Air Coordinating Committee for inclusion in the air policy review currently being prepared for President Eisenhower. Included in the group of items are a tighter control on subsidies, consolidations of trunklines, termination of local service lines unless they show progress toward self-sufficiency, and stricter rules for the large irregular carriers.

The proposals have been submitted to the industry for comment and are subject to change by the ACC before submission to the President.

Long-Haul Saturation Foreseen by Aldrich

In a market analysis of air traffic potential, Grahame Aldrich, ATA's director of special projects, finds that the airlines will face their most critical years between 1955 and 1965.

Major problem facing the carriers will be saturation of the long-haul passenger market. Aldrich predicts that by 1965 scheduled airlines will be carrying 82% of all passengers traveling over 1000 miles. "'Indigestion'" begins at that point where the airline penetration of the long-haul market approaches 80% to 85%, he states. "Thereafter, the ability of the carriers to capture more common carrier traffic at an annual rate which is comparable to past experience, becomes an impossibility." The airlines now have 72% of the long-haul market.

By increasing schedule frequency, time-table dependability, and airport accessibility, fixed-wing operations can increase penetration of the 501-1000 mile market from the present 37% to nearly 60% by 1965, Aldrich estimates.

First take-off from Los Angeles International Airport is made by North American's Super Sabre F-100. Production models had previously been trucked to Edwards Air Force Base from the Los Angeles plant. F-100 holds world's record of 755.149 mph and is capable of supersonic speed in level flight.

Navy Under Fire in Trainer Contest

By Harry S. Baer, Jr.

A HOT CONTROVERSY has been stirred up by the Navy's decision to reopen negotiations with Beech Aircraft Corp. and Temco Aircraft Corp. for the purchase of a new primary trainer type.

As a result, the following developments have transpired:

- **Revelation** of a Navy Bureau of Aeronautics telegram to Beech indicating initial choice of this firm's aircraft over other competitors.
- **A recent inquiry** to the Navy by Sherman Adams, Assistant to President Eisenhower, indicating White House interest in the matter.
- **A move** on the part of other aircraft firms to enter the competition.

When the Navy on April 9 announced its reopening of negotiations, it asked that only Temco and Beech submit new bids, these to contain a revised set of specifications based on changes recommended by BuAer after extensive tests with both the Beech Mentor and the Temco Plebe. Spare parts for each aircraft were asked to be included in the new cost estimates.

Shortly after this development, the BuAer wire to Beech was revealed, indicating that the action ran counter to initial BuAer evaluation results of the two trainers. Dispatched to Beech at Wichita, Kans., on February 25, 1954, the wire reads:

"YOUR COST PROPOSAL TRANSMITTED BY YOUR LTR S-61268 DTD 12 FEB 1954 IS ACCEPTABLE AS A BASIS FOR PROCUREMENT OF A QUANTITY OF T-34A MENTOR LIGHT TRAINERS. YOUR COOPERATION WILL BE REQUESTED IN THE NEAR FUTURE TO ENTER NEGOTIATIONS. THIS SHOULD NOT BE CONSTRUED AS AN AUTHORITY TO PROCEED OR AS OBLIGATING THE GOVERNMENT IN ANY WAY."

A BuAer wire which was essentially negative in regard to the Temco Plebe was dispatched to Temco at Dallas, Tex., simultaneously, it is reported.

Navy decision to reopen negotiations after this BuAer action was made by Raymond H. Fogler, Assistant Navy Secretary in charge of procurement. He told American Aviation he was responsible for the move, adding "it wouldn't have been done unless I approved it." He also said his decision had "full concurrence" of BuAer and that "the Bureau of Aeronautics has decided that either plane with modifications would be satisfactory."

Last Sentence Loophole

Asked about the February 25 wire to Beech, Fogler said it did not mean that Beech had been selected the winner. He pointed out the last sentence of the wire (which is a standard phrase in such BuAer negotiation communications), saying it was included "in case you want to make a different approach."

The assistant Navy secretary said, however, that Temco "came in with a lower proposal" at a later date after both firms had submitted cost estimates. This was after February 25, reportedly on March 1.

Fogler said "nothing prevented Temco from making a second proposal." He explained that he considered these estimates "a request for proposals for negotiations," not bids, and expressed no knowledge of a closing date "in the sense of advertised bids."

Lynn Richardson, Beech vice president of military sales, told American Aviation that the initial BuAer letter requesting price quotes stated that they "should be submitted as soon as possible or in any event prior to February 15, 1954."

"It is my understanding that Temco was told the Beech price during a conversation with a Navy official, following what we had considered the closing date of the competition," Richardson said. "The Temco price revision was then submitted to BuAer after February 25, date of the BuAer wire to Beech, which we considered an acceptance."

Asked for a statement on the matter, Robert McCulloch, Temco president, replied: "Temco to date has refrained from making any public statement pertinent to the Navy's procurement policy in the present trainer program. However, we feel constrained to emphatically deny the allegation made by our competitor that their price submitted February 15, 1954, as stated, was disclosed to Temco by any individual either in or out of the Navy, and as of today's date, Temco is not aware of this price quotation."

(After the February 25 wires had been sent, Rear Adm. Apollo Soucek, BuAer chief, told a Temco representative that his firm's price was "roughly 10% higher" than Beech's, authoritative sources later told American Aviation. It was further explained that Soucek was "acting in good faith on the basis that BuAer had reached its decision and notified the competitors.")

Meanwhile, Fogler told American Aviation that he had received an inquiry regarding the Beech-Temco matter from Sherman Adams, the President's assistant, to which he responded. He did not reveal the nature of the inquiry. State senators are also actively at work on the matter, it was learned.

Late last month, Fairchild Engine & Airpane Corp. at Hagerstown, Md. submitted designs and cost estimates for consideration in the controversial Navy trainer competition. Manufacturer of the widely used PT-19 trainer during World War II, Fairchild based some of its design entries on a type it had entered in a competition some five years ago, in which no contract was ever let.

Ryan Aeronautical Co., San Diego, Calif., builder of the side-by-side-seating Model 72, which remained in the current Navy trainer competition when it was narrowed down to three companies but was finally eliminated, is studying the possibility of re-entering the contest, it is understood.

Asked earlier if other companies, aside from Temco and Beech, could enter the competition, Fogler said, "We don't contemplate that." James H. Smith, Jr., Assistant Secretary of the Navy for Air, commented that it "is not beyond the realm of possibility for others to enter." • • •

Atomic Aircraft in 10 Years: Hibbard

Nuclear-powered aircraft will be no larger than today's big military planes, nor will their exterior appearance be any different. They will use conventional propulsion systems, such as turbojet, turboprop, or rocket powerplants. They will likely be on the scene within 10 years as military aircraft, and not much later as supersonic commercial transports.

Such information, the most publicized yet about nuclear flight possibilities, comes from Hall L. Hibbard, vice president of engineering for Lockheed Aircraft Corp., a firm that has been studying this subject for the Air Force for more than four years.

The statements point up a growing trend of greater optimism about nuclear-powered aircraft within recent months, counteracting pessimism voiced a year ago by top defense officials. At that time they claimed the problem of shielding the crew from injurious nuclear radiation would call for an atomic plane too heavy to be practical, one which they termed of "Pentagon proportions."

Divided Shielding

However, Hibbard points out perhaps the greatest development yet achieved in this field, one in which the total shield weight can be materially reduced. Known as "divided shielding," some is placed on the nuclear reactor and the remainder is placed around the crew at the flight station.

"It is apparent that divided shielding will be most advantageous and applicable when the flight crew is concentrated in one area and, further, when the area is fairly small, since the occupied quarters must be completely surrounded by shielding," Hibbard explained.

Divided shielding differs from the usual concept of reactor shielding, known as "unit shield." In the latter, all of the shielding necessary to reduce the radiation to a level tolerable by the human body is placed directly around the reactor, calling for a considerable amount of additional weight.

In discussing nuclear power, Hibbard pointed out that the reactor is the heart of the propulsion system. It provides the heat necessary to operate a nuclear aircraft powerplant, taking over the function of conventional combustion chambers that now supply heat for aircraft by burning chemical fuel.

"The reactor is essentially a simple device in which a proper arrangement of uranium, moderator, reflector, and controls, permits sustenance of a controlled, continuous, fission process—a sort of a domesticated atom bomb," Hibbard explained. "The heat source may be used to drive a turbojet engine, or it may be used to drive a turboprop engine, and still a third use is for rocket engines."

Other Aspects

Other points revealed publicly for the first time by Hibbard in his address before the Air Force Association's State Wing Convention at Santa Monica, Calif., included:

- **Nuclear power** for aircraft is advantageous not only because of its unlimited range capabilities but also because of its unlimited endurance, regardless of speed.
- **At this stage,** it appears to have no magic attributes which automatically guarantee its complete system superiority over chemically powered means of accomplishing the same objective.
- **A nuclear-powered aircraft** would have no particular significant differences in outward basic arrangement, appearance, or size over large present-day aircraft, nor would its flight or noise level show startling characteristics.
- **The first generation** of nuclear-powered aircraft will probably be strategic bombers having supersonic speed capabilities for intercontinental missions.
- **Not too much later,** the first nuclear-powered supersonic commercial transport will be proven practical, with a speed of at least two and perhaps even three times the speed of sound.

Growing Interest

Hibbard's revelations point up the growing interest of the military and the aircraft industry over the approaching practicability of atomic flight. More and more aircraft and engine manufacturers are moving into this area under the sanction of the Atomic Energy Commission.

Total number of companies announced to be working in this field is eight. They are:

Lockheed Aircraft Corp., Boeing Airplane Co., Consolidated Vultee Aircraft Corp., North American Aviation, Inc., General Electric Co., United Aircraft Corp. (Pratt & Whitney Aircraft Division), Fairchild Engine and Airplane Corp. (Fairchild Engine Division), and Bendix Aviation Corp., the most recently announced entrant.

Airport Operators Endorse Aid Plan

Strong endorsement of a federal-aid airport program of the type proposed by the Commerce Department was voted by the Airport Operators Council at its seventh annual meeting in Tampa, Fla., last month.

Robert B. Murray, Jr., Under Secretary of Commerce for Transportation, told AOC that the program must be concentrated on airports representing the "highest degree of national interest and essentiality." Increase from 25% to 50% in the size of the discretionary fund, and elimination of terminal building construction from the program are also favored by Commerce.

Glass

Concern over how to build future terminals so they will not become obsolete quickly was expressed at the meeting. Seeley V. Hall, United Air Lines' assistant vice president of facilities, asserted that "it is vital that . . . future expansion be along more functional lines. This is not a job for the airlines alone. City governments and port authorities must realize the problem . . ."

Airlines Blamed

Hall's remarks drew a blast from Frank Callahan, of Chicago's Aviation Bureau, who said that "what is wrong with terminal buildings is airlines." He stated that airlines were responsible for design of Chicago's sprawled-out terminal, to which they now object.

Fred Glass, newly elected AOC president and director of the Port of New York Authority's aviation department, said cities are faced with building terminals "without knowing the criteria, and the customer can't tell you." Solution to the "ramp clutter" problem may be for the carriers to standardize some of their equipment and consolidate some of their ramp activities, he said.

Adm. C. E. Rosendahl, executive director of the National Air Transport Coordinating Committee, warned AOC that the public's attitude toward aircraft noise and low flying can change from "passive tolerance to active opposition" very quickly. To avert such a change a "carefully thought-out nd continuing public relations effort" is needed, he stated. Several AOC members expressed concern over the noise problem and indicated that they are stepping up public relations activities.

Hurley Asks Industry Tooling Control Plan

Tells SAE forum that C-W machine tools are now 78% rebuilt World War II equipment.

FOR the second successive year more than 800 of the aircraft industry's top production specialists responded to the opportunity to trade notes and know-how on the ways and means of meeting the challenge of producing more airpower for fewer dollars. The occasion was the recent Society of Automotive Engineers' annual production forum spearheaded again by Curtiss-Wright Corp. president Roy T. Hurley.

Sounding the keynote of this year's meeting in one major area of potential production improvement, C-W's Hurley called for accelerated depreciation allowances that would permit the aviation industry to embark on a much needed machine tool re-equipment program. We're not going to build the aircraft of tomorrow with the machine tools of yesterday, he warned, and cited as an example the present situation at Curtiss-Wright, where out of 6800 machine tools, some 5300 (78%) are early World War II models that have been rebuilt at least once.

Chapline

Hurley pointed out that a machine tool program such as recommended would cut costs and soon pay for itself. If the manufacturers had the ability to supply their own tooling, the by-product effect would be to cut the time between design engineering and production engineering, one of the major bottlenecks in today's production set-up.

New tax legislation now being considered, Hurley said, is a step in the right direction, but doesn't go far enough. He placed the desirable depreciation allowance at five years instead of the twelve years now customary.

During seven individual panel sessions of the day-long forum, production experts discussed:

• **Factory Cost Control**—Panel Leader F. H. Wittmer, Fairchild Engine Division. Education of first line supervision (foremen) on budget matters has, without exception, become standard throughout industry. The usual approach is to set up proper running times for each operation, then to plot actual performance against this standard. Follow-up reports by foremen comparing their shop activity with the standard vary in frequency from daily in some organizations to monthly, depending on the economics and needs of each individual company.

The term manpower control was ruled out as unacceptable in the true factory cost control system. The point made here was that it was no more possible to control manpower alone than it is material alone. Instead the approach is to establish a budget to control both material and manpower as they are related to overhead and to compare the actual combined results against the budget forecast.

• **Quality Control**—Panel Leader A. L. Johnson, Bendix Products Division. A practical figure for estimating costs of quality control systems was placed at from one to three per cent of sales. For each 42¢ spent in manufacturing costs, it was estimated that 53¢ is spent in quality control, with 20% allocated to overall inspection and testing, and 10% to actual control of quality.

Emphasized during this session was the importance of developing a strong working relationship between engineering, manufacturing, tooling, and inspection organizations as a necessary part of an effective quality control system.

Greatest asset to the quality control division in achieving this teamwork is the material review board type of organization, which gives opportunity for constant review of the materials picture, has the effect of pointing up weaknesses, and produces better substantiating evidence with which to seek and obtain consideration of material specification changes.

• **Lead Time & Engineering Changes**—Panel Leader H. V. Beuttell, Republic Aviation Corp. Major problem in this area continues to be the inability of manufacturers to meet effectivity points (production line schedules for changes) with the resulting necessity for approval from the military. Most in need of attention are means of speeding up cost approval of changes, use of tool proving programs to prevent subsequent delays, and control of follow-on revisions once a change has been introduced into production.

• **Manufacturing Methods**—Panel Leader K. W. Stalker, General Electric Co. Wider industry participation in the development of tooling plastics was urged by A. A. Merry, Pratt & Whitney chief advance tool design engineer. Merry cited examples of P&W use of die forms, plug gages, height checking fixtures, and even in duplicating actual parts for mock-up engineering work. Advantages named for plastics were:

Savings in weight and handling time over heavy dies;

Lower materials cost when used for parts duplication;

Plate reverses made easier to store and lighter than plaster.

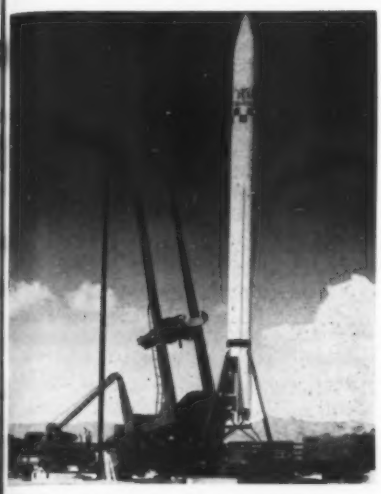
• **Metallurgical & Chemical Processing**—Panel Leader H. H. Hanink. Major discussions centered around the use of precision versus normal standard forgings, with the conclusion that early results showed large economies to be realized through the use of precision forgings, particularly where sizable quantities are involved. It was generally agreed that a major problem with titanium remains one of stock removal-tool life in machining operations.

• **Factory Personnel Relations**—Panel Leader R. S. Livingstone, Thomson Products, Inc. The trend toward automation of shop equipment will not lessen the necessity for management dealing with people, whether it concerns the new shop environment or their divided loyalty between management and union. This same trend is now pointing to the need for a new shop craft, that of the electro-hydraulic maintenance man, to keep the automatic equipment performance up to par.

One other area named for attention was personnel selection, with the practice of conducting a five- to ten-minute pre-employment interview considered wholly inadequate for the individual who will possibly remain with an organization for 20 years and eventually represent an investment of some $200,000.

• **Production Control**—Panel Leader D. C. Fehleisen, Fairchild Engine Division. Best indication of a sound production control system remains the absence of materials "hot" lists and the ability to curtail confusion in the coordination of the varied management activities.

Success of the production forum since its start has grown out of complete industry support. Before the curtain was drawn on this year's session its continuation for at least another year was assured when George F. Charline, vice president and general manager of Fairchild Engine & Airplane Corp.'s engine division, made it known that he was prepared to sponsor the 1951 conference. • •



Added to the arsenal of Army weapons, this guided missile called the "Corporal" is a surface-to-surface weapon capable of engaging tactical targets far beyond ranges of the Army's latest artillery. In large scale production by Firestone Tire and Rubber Co. and Gilfillan Brothers, Inc., the "Corporal" is powered by rocket and moves at several times the speed of sound. The Army has also unveiled the Douglas "Honest John,' a free-flight rocket which will be used tactically to provide close fire support in ground combat operations.

Safety Center Asks CAB Push Airline Research

The Civil Aeronautics Board should see to it that the airlines spend more of their money on air safety research, in the opinion of Cornell's Guggenheim Aviation Safety Center.

In its fourth annual survey of research projects in the field of flight safety, the Center declared that since all airlines are not showing the same amount of initiative in pursuing such work, the Board should, "through its financial control of air carriers, make provision for and urge them to use more of their funds for research."

The Center also cited the cutbacks in funds available for work in air traffic control as a source of danger. Although noting that such cutbacks were due to "a commendable effort to reduce governmental expenditures," the report went on to warn that "economies forced on those doing important research in this field have seriously curtailed their work," and noted that "an antiquated air traffc control system . . . raises the spectre of mid-air collisions."

Almost 1360 research projects are listed in the survey report, copies of which can be obtained at $1 each from the Cornell-Guggenheim Aviation Safety Center, 471 Park Avenue, New York 22, N. Y.

News Briefs

MANUFACTURING

Glenn L. Martin reports first quarter sales up 22% over the similar period of last year. Net came to $2.47 million (before taxes), compared with last year's figure of $1.75 million. . . . **Net of the Garrett Corp.** for the nine months ended March 31 has been reported as $2.4 million, up from $2.2 for similar period the year before. Backlog as of March 31: $95 million. . . . **Arthur E. Raymond,** vice president of engineering for Douglas, believes that transports now in operation or on order by airlines will set the pattern for the next few years.

Subcontract from Ford's jet engine plant totaling more than $6.6 million has been given to Solar Aircraft Co. Work on parts for the J57 will be done in new Solar plant at Des Moines. . . . **Structural demonstrations** on the Navy's AD-5 are being completed by Douglas at Patuxent Naval Air Test Center. . . . **Second early warning radar** Super Connie (WV-2) has been delivered to the Navy in Hawaii. First one went to the Atlantic fleet. . . . **Two Piasecki engineers** have received the SAE's Wright Brothers Award for 1953. A paper titled "Matching the Characteristics of Helicopters and Shaft Turbines" won the award for Donald N. Meyers and Z. M. Ciolkosz.

A new wind tunnel to study airflow at transonic and supersonic speed (up to Mach 3) is being built by Cornell Aeronautical Laboratory at a cost of $150,000. . . . **Overhaul and maintenance** contract for 33 Navy R6D transports has been given to the Temco Aircraft Corp. The contract, on which seven firms submitted bids, comes to more than $500,000. . . . **Piper Aircraft** has reported earnings of $198,000 for the six months ended March 31. Similar period last year produced earnings of $167,000. . . . **Three top union officials** at North American's Columbus plant have been relieved of their posts by the UAW-CIO's International Executive Board. There has reportedly been dissension in the local since last fall's walkout.

The SAE, due to celebrate its 50th anniversary in 1955, is looking for information on aviation firms which also have major anniversaries due that year. . . . **A contract to install E-9 autopilots** in a number of F-84F's has been given to Lockheed Aircraft Service by Republic Aviation.

AIRLINES

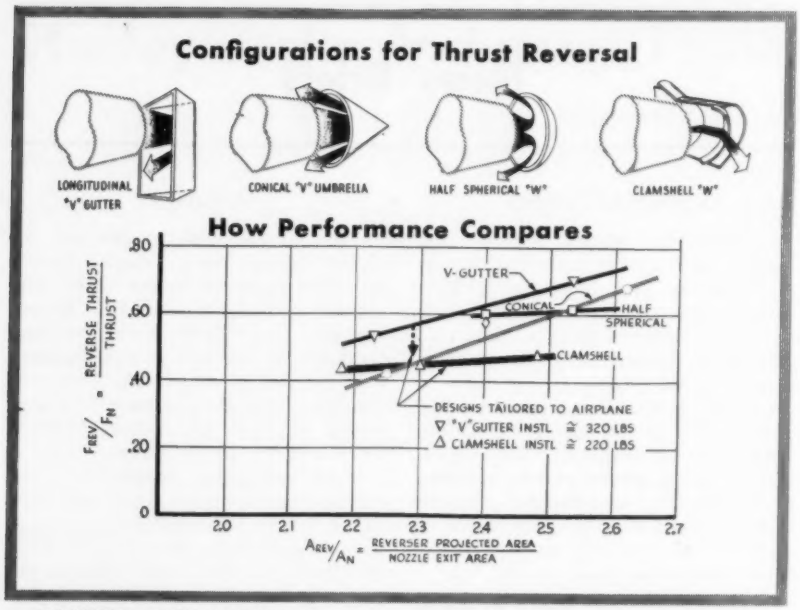
A 105-seat configuration for the Flying Tigers Line's Douglas DC-6A has been approved by the CAA. The aircraft recently carried 101 Korean veterans on a CAM movement from California to Chicago. . . . **A "package deal"** is being sought by Philippine Air Lines in order to dispose of a large supply of spare parts along with its DC-6 and DC-6B equipment.

Air navigation meeting for the North Atlantic region has been scheduled by the International Civil Aviation Organization for October 5 in Montreal . . . **Dr. John P. Marbarger,** research director of the Aero Medical Assn. at the University of Illinois, has received UAL's annual Tuttle Award. Presentation was made for Marbarger's research which established that no adverse effects on heart and circulation are produced by flight in pressurized airliners . . . **The Airport Operators Council** wants the CAB to set minimum flight altitudes for planes taking off and landing at public airports, hoping that this will help soothe nearby communities.

Ferrying a new DC-6B from San Diego to the east coast loaded with a military CAM movement instead of dead-heading it brought Pan Am some $8000 in revenue recently . . . **Delta-C&S Air Lines** reports a first quarter operating profit of $756,000; profit after taxes was $167,000 on gross revenues of over $13 million . . . **First of two Curtiss-Wright DC-6B simulators** has been delivered to United Air Lines. Orders have been placed by Swissair and SAS for similar units, one each.

The Vickers Viscount turboprop transport has been inspected by three top officials of Capital Airlines on what was described as an "exploratory" visit to the British firm . . . **Western Airlines** marked its 28th anniversary on April 17 . . . **New president** of the Airline Ground Transportation Assn. is **Jesse Smith,** president of the Yellow Cab Co. of Cleveland, Ohio . . . **The Air Transport Assn.'s Stuart Tipton** has put the ATA on record as opposing a rewriting of the 1938 Civil Aeronautics Act, "with minor exceptions."

Resort Airlines has denied reports that it is in poor financial shape, terming them "greatly exaggerated," although winter traffic was disappointing and the summer program was postponed from April 18 to June 27 to allow time for more promotion.



ASSORTED CONFIGURATIONS that were tried by Boeing during its program of study are shown above. Clamshell at far right was finally picked as best.

Boeing Reverses Thrust Without Penalty

Normal engine thrust is unaffected by clamshell device when it is not in use; other designs tested.

By JOSEPH S. MURPHY

THE jet engine reverse thrust development program appears well on its way toward an early and much needed face-lifting. After a long lull, which at times gave the impression that progress in the U.S. was doomed to run a poor second to developments abroad, the situation is making a sharp about-face.

The key event pointing to increased activity in this direction was the recent announcement by Boeing Airplane Company of its development of a mechanical thrust reverser, climaxing an extensive research program which began in 1951. According to Joseph F. Sutter, Boeing aerodynamics engineer who first disclosed the system details before a Society of Automotive Engineers meeting in New York, the study shows promise of early perfection of a jet reverser which would:

- **Impose no economic penalty** on the engine in the form of a continuous thrust loss during normal flight;
- **Give the jet airplane** the same operating flexibility enjoyed by transports using reversible propellers.

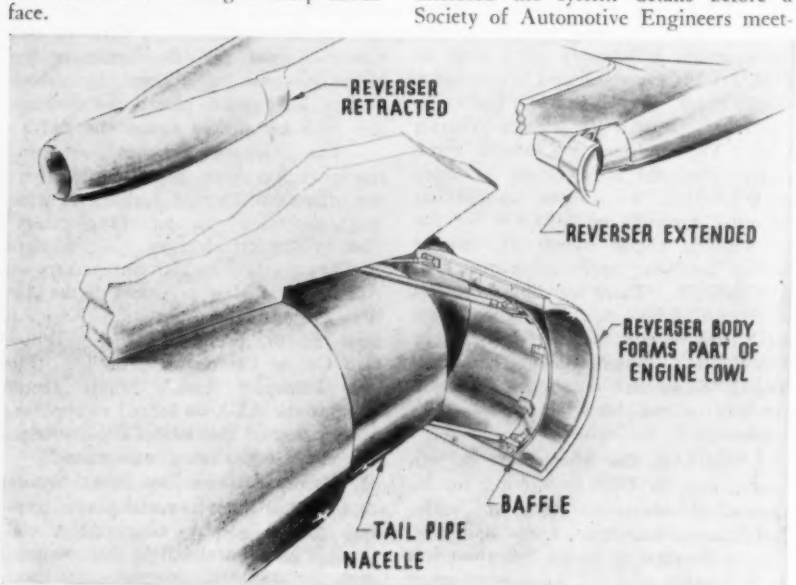
The Boeing announcement is doubly significant. It not only represents the first revelation by an American manufacturer of detail design work on a jet reverser, it also points up a trend in the U.S. toward coping with thrust reversal by mechanical means, as opposed to the "aerodynamic" approach employed abroad by both the French firm SNECMA (Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, in Paris) and by the Swiss Federal Institute of Technology (AMERICAN AVIATION, April 12).

This basic difference in approach is not only apparent in the Boeing system, it is also confirmed by the limited information available on a thrust reverser now under development by Fairchild Engine and Airplane Corporation (see sketch). Furthermore, during the same SAE meeting which saw the unveiling of the Boeing system, research engineer Thomas Brewer of Curtiss-Wright Corp., Wright Aeronautical Division, commented that testing at Wright of some 70 reverser configurations brought "findings much the same as Boeing's."

In its thrust reversal study Boeing first had to arrive at a set of design objectives for the device. How good must it be? When could it be used? What would be its limitations? The answers were:

- **Safety and reliability** must be inherent through basic design and use of simple structural locks. Electronic controls and intricate protective devices were to be avoided.
- **Performance must be comparable** to that of present transports. The reverser should be able to stop a jet aircraft on an icy runway with brakes and reverse thrust in the same distance that is now possible with brakes alone on a dry runway. Boeing analysis showed that reverse thrust of about 40% of maximum engine thrust would be needed to fill the bill.
- **Ground control only** was adopted as a basic assumption. In-flight use of reversal was ruled out to ensure the simplest design possible.
- **No effect on engine operation** was allowed. Reverser when not in use should not penalize engine economy by introducing any constant loss of thrust. Conversely, it should not produce any harmful effect when used.

Using its jet engine nozzle test



TYPICAL INSTALLATION of Boeing device would have reverser forming part of the engine cowling when it is not in use. Note shape of baffle for "W" effect.

facility, many shapes of likely reversers, as shown in accompanying illustrations, were tried by Boeing. Tests showed thrust reversal ranging from about 38% to as high as 73% was possible with these designs (see graph), by varying the ratio of the reverser area to that of the nozzle exit area.

Best solution arrived at was the design described as a clamshell "W."

In the unused position this reverser could be retracted in two parts to form the aft fairing of the engine tail pipe. For thrust reversal, hydraulically operated struts would move the clamshell halves into position to block the jet blast completely.

Integral curved deflector plates would serve to direct the thrust reversal for best efficiency, which, according to preliminary figures, would provide close to 50% reversal using a device with 2.5 times the nozzle exit area.

Boeing concentrated on this clamshell arrangement as showing the best promise in meeting all of its design objectives, and at the same time being the simplest, lightest, and easiest to stow of all the types tested. One big advantage was its adaptability to all types of engine installations.

However, considerable effort was also spent in developing the so-called "V" gutter reverser.

Weight of a typical clamshell reverser would be about 800 pounds for a four engine installation, Boeing estimates. Sutter pointed out, however, that with the benefit of more extensive development and operating experience, this weight could undoubtedly be reduced. Assuming the Boeing estimate to be based on an engine such as the P&W J57, which will power its B-707 jet transport, the estimated reverser weight compares favorably with figures cited for the SNECMA device.

According to officials of Aerojet General Corp., U.S. licensee for production of the SNECMA reverser, weight penalties as low as three per cent of engine weight are possible. In the case of the 5000-pound J57 this would mean a reverser weight of about 150 lbs.

In the case of the SNECMA device the thrust loss has been cut to as low as two per cent on some installations.

An important by-product of the work done by Boeing in its study was an analysis of the effects to be expected of take-off and cruise reverser failures, should they occur.

Comparison was made with the effects of propeller reversing systems failures, assuming that for each malfunction analyzed a "severity factor" of one would represent the equivalent of a single engine failure, or loss of total thrust on one engine.

Results showed that for most severe propeller condition, where the propeller control fails with power on and blades move to full flat pitch on take-off, the effect amounts to the equivalent of 2.5 engine failures.

In the case of jet thrust reversal, the most critical take-off failure would involve extension of the reverser with power on. However, the effect here would only amount to slightly more than 1.5 engine failures.

Other take-off conditions showed these comparative results:

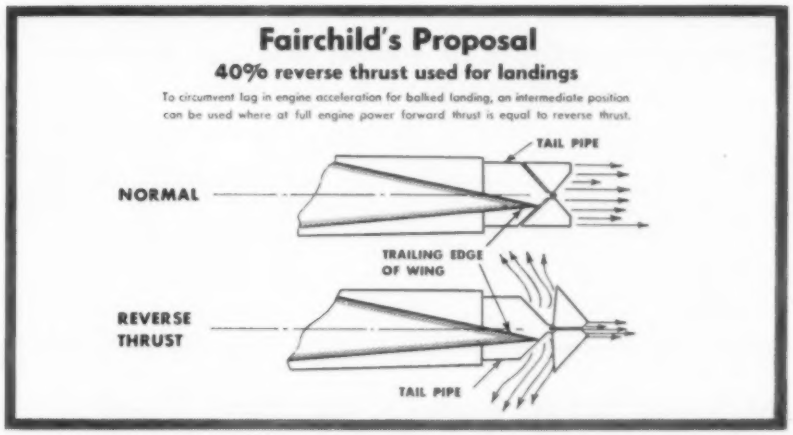
Reversible Propeller Condition	Severity Factor
Power fails, prop feathers	1.0
Power fails, prop to low pitch stop	1.2
Prop fails, power normal, prop flat pitch	2.5
Power off, prop flat pitch	1.9
Prop fails, power normal, prop reverse	1.4
Power off, prop reverse	1.3
Jet Reverser	
Power fails, reverser retracted	1.0
Power normal, reverser extends	1.55
Power off, reverser extends	1.05

Main point raised by Boeing in this analysis is the advantage in favor of jet reverser systems which operate separately from the basic forward thrust system. In reversible propeller installations, the same system components which must operate continuously during flight are used to control the reverse cycle, increasing the exposure to failure during the entire flight.

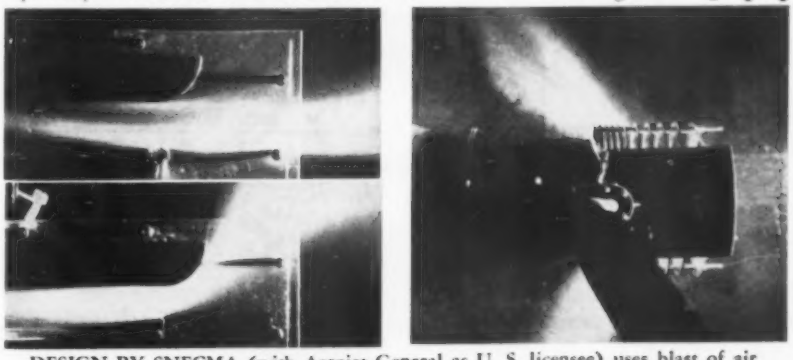
Next step at Boeing will be the construction of an actual prototype reverser for trials on an airplane installation. Although no such move is contemplated in time for the first flights of its prototype jet transport this fall, officials expect that the reverser will be completely developed within a year, making it available for production versions.

Main answer to the speed of progress by Boeing as well as other U.S. reverser designs now appears to rest with the U.S. Air Force. First action by the USAF several months ago in soliciting industry interest in reverser design study contracts now points to expected follow-up soon in the form of actual development contracts.

Should these contracts materialize it could well follow that Pentagon predictions of prototypes flying by the end of 1954 will come true. But what is even more significant, this support could very well put the U.S. in the lead in jet reverse thrust design. • • •


Fairchild's Proposal
40% reverse thrust used for landings
To circumvent lag in engine acceleration for balked landing, an intermediate position can be used where at full engine power forward thrust is equal to reverse thrust.
TAIL PIPE
NORMAL
TRAILING EDGE OF WING
REVERSE THRUST
TAIL PIPE

DESIGN BY FAIRCHILD permits part of the exhaust gases to continue out through reverser in normal direction; partially closed position can also be used.



DESIGN BY SNECMA (with Aerojet General as U. S. licensee) uses blast of air bled from compressor to deflect exhaust gases toward series of rings. These direct the gases forward, as in engine photo at right. At left, top photo, in laboratory, shows normal exhaust; bottom shows effect of air blast at right angles.

Comparative Costs of Piston and Jet Airliners

DC-6 and Typical 80-Passenger Jet

	DC-6		Jetliner	
	Cents/mile	% of total	Cents/mile	% of total
Total flight operations	50.3	54	62.9	43
Total direct maintenance	29.6	31	39.8	27
Depreciation	13.9	15	43.6	30
Totals	93.8	100%	146.3	100%

Jetliners Main Safety Meeting Topic

Annual ALPA conference considers jet transport costs and the problems of pilot transition.

CHICAGO—The second annual Air Safety Forum sponsored by the Air Line Pilots Association, headed by Clarence Sayen, included panels discussing subjects ranging from meteorology to airborne radar, but the greatest interest focused on jet transport operations.

M. G. (Dan) Beard, vice president of engineering and equipment for American Airlines, told the 100 pilots and government officials in attendance that the U.S. market is ready for jets provided that they are introduced gradually. He added, however, that no U.S. airline has ordered a jet for domestic operations (Pan American has three Comet III's on order) because of the high cost of depreciation.

AA's studies comparing a typical jet transport with the Douglas DC-6 indicate, Beard reported, that the cost of flight operations and the cost of direct maintenance are lower as far as percentage is concerned, but the cost of depreciation is double (see table).

The AA vice president said there

Sayen

Beard

are now four jet transports on the horizon which show promise of competing with existing piston airliners economically: Boeing's 707, Douglas' DC-8, Lockheed's L-193, and de Havilland's Comet IV. All of these planes, he declared, carry the same designations they did two years ago, but they are completely different as far as economics and engineering changes are concerned.

The future U.S. jet transport, Beard predicted, will gross between 175,000 and 200,000 pounds, carry a payload of 28,000-30,000 pounds, cruise at 520-540 mph on long trips and 550 on shorter runs because of the lower payload, and will provide a minimum of 80 seats in the standard version. Specific fuel consumption will be about .95 pounds of fuel per pound of thrust per hour at 85% rated rpm.

Another reason for the delay in orders for commercial jets, he said, is the high cost. "Not many" will be ordered in the first go-round because at prices ranging from $3.5 to $4.5 million each, a dozen jet airliners with spares would cost about $50 million, "or about half the net worth of any one of the major U.S. airlines."

In another talk, Douglas Fraser, technical assistant to the British Civil Air Attache in Washington, opined that the early introduction of jets (as British Overseas Airways Corp. introduced the Comet I) "is not without its blessings."

Both jets and piston airliners need reliable navigation aids, better weather forecasting, reduced landing and departure delays, and less interference with climb and descent paths, but their absence places a greater penalty on the gas-turbine transport. Thus, Fraser said, when the jet operator pushes for these improvements, piston planes benefit simultaneously.

More Round Trips

ALPA pilots at the meeting were told by Ed Bracher, supervisor of production flight test at Boeing-Wichita, that they would have little trouble making the transition to jetliners. But Fred Illston, an American Airlines captain, while conceding that the simpler controls would make jet flying easier, indicated the pilots expect other problems, especially in some revision as regards working conditions.

"Today we fly 13.8 round trips per month between New York and Chicago. Tomorrow at 500 mph, we will be able to fly 25 round trips in an 85-hour month," Illston declared.

An earlier discussion by another panel on cockpit procedures included a comment by Lawrence Shapiro, United Air Lines captain, that there are four factors which increase a pilot's work load and thus help to contribute to the 38% of aircraft accidents which are blamed on "pilot error."

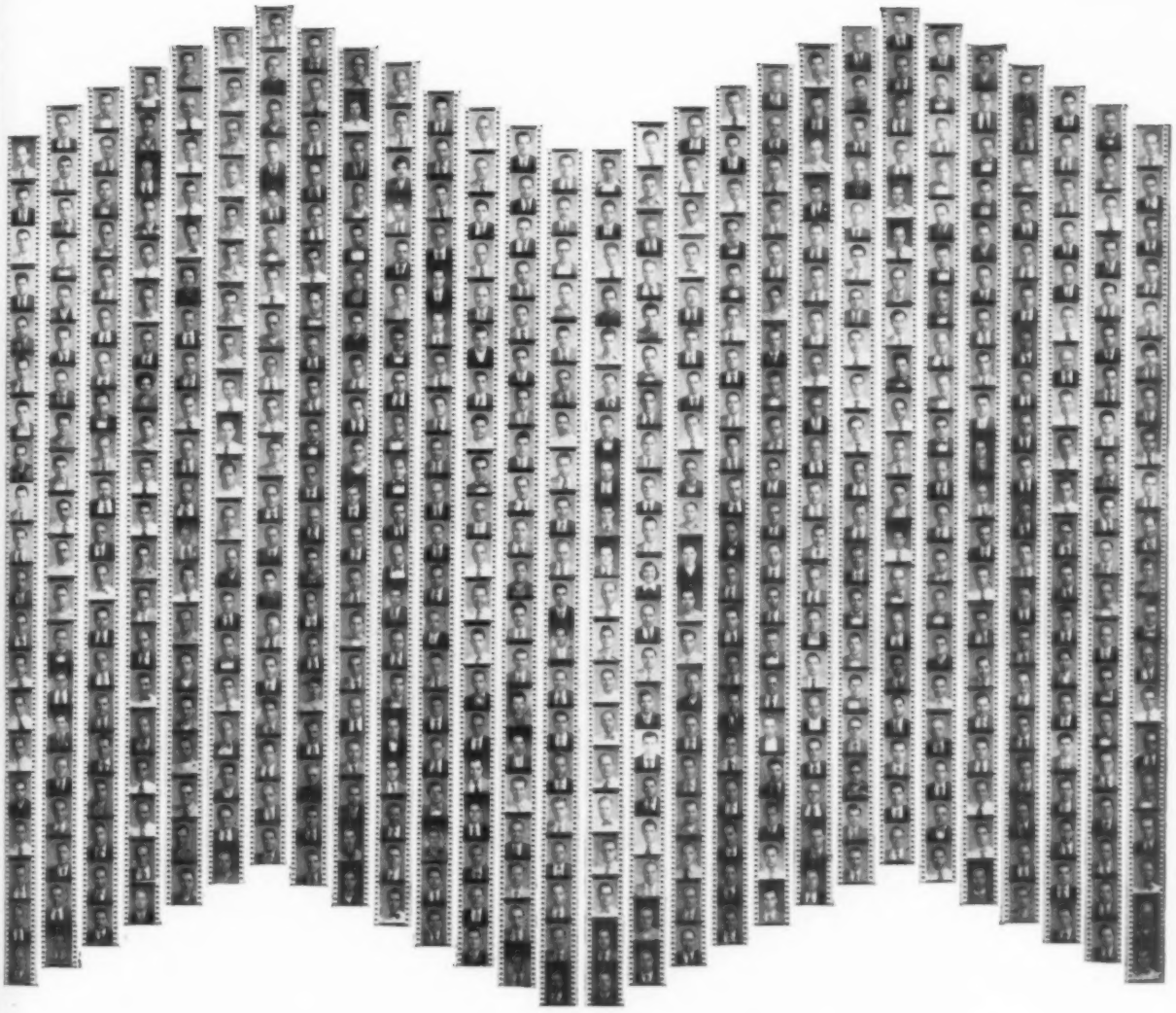
These factors include poor cockpit organization, in-flight decisions and technique, abnormal conditions, and lack of familiarity with the route, procedures, or equipment.

Other factors tending to cause poor cockpit procedures, Shapiro said, are such intangibles as attitude, mental fatigue, cockpit anxieties and personal anxieties, and such real situations as sleepiness, physical fitness, and work irregularity. • • •

Major USAF Accidents per 100,000 Flying Hours

In Cargo and Transport Aircraft

Plane type	Total Major Accidents	Those Due to Cockpit Procedures
Fairchild C-82	34.0	3.4
Fairchild C-119	23.0	3.6
Curtiss C-46	14.0	2.5
Douglas C-124	10.0	2.1
Douglas C-47	7.0	2.4
Boeing C-97	7.0	0.7
Douglas C-54	4.0	0.6
Douglas C-118	3.0	1.3
Convair T-29	2.0	0.0
Average all types	8.3	1.9



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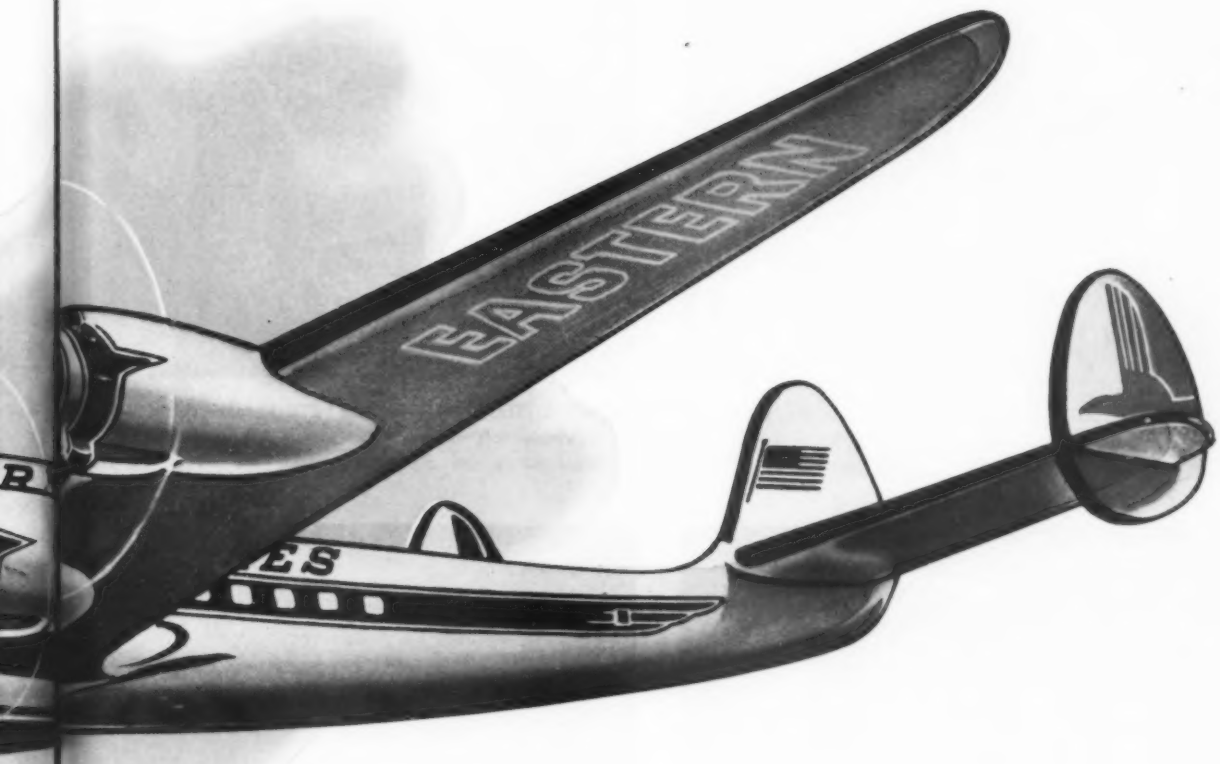

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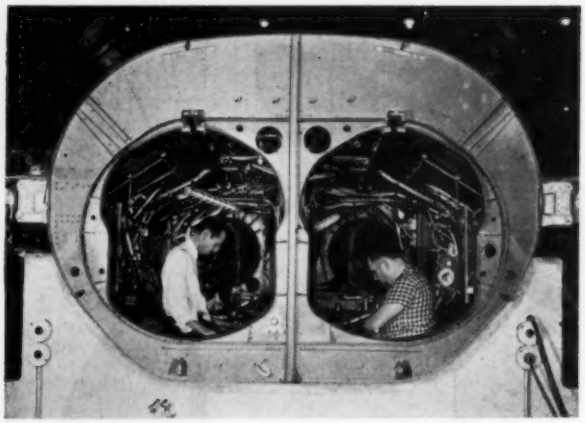
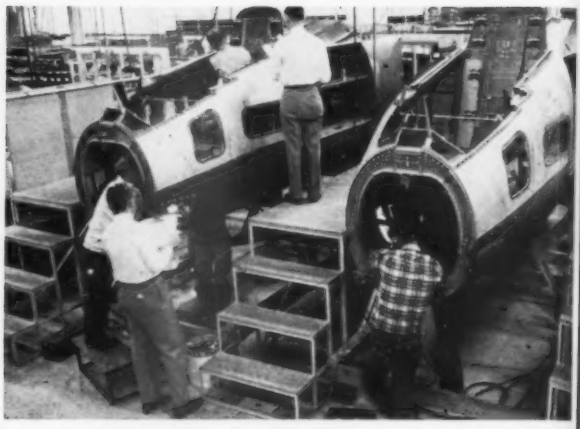
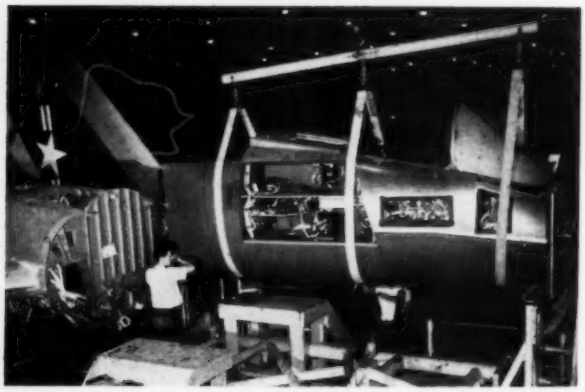


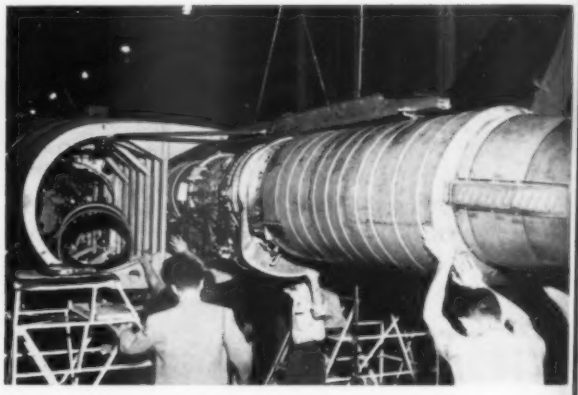
1. CENTER SECTION of the Chance Vought Cutlass is equipped with wiring and other fittings on assembly line.



2. NOSE SECTIONS for the F7U-3 take shape in sub-assembly loft as two Chance Vought inspectors look on.

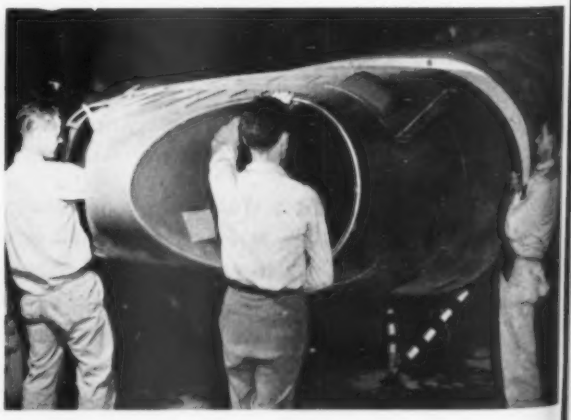


3. NOSE JOINS center section as it is swung into place by means of belly-band slings. Wings are already attached to fuselage at this stage; sliding canopy and electronic gear have not yet been fitted to nose section.



4. WESTINGHOUSE J46 turbojet is set into plane in the fuselage, entering through the rear, from which the tail cone (see below) has temporarily been removed. The afterburner appears as the long, smooth portion at right.

5. TAIL CONE sub-assembly operation. Riveters put finishing touches to orifice through which jet exhaust makes its exit.

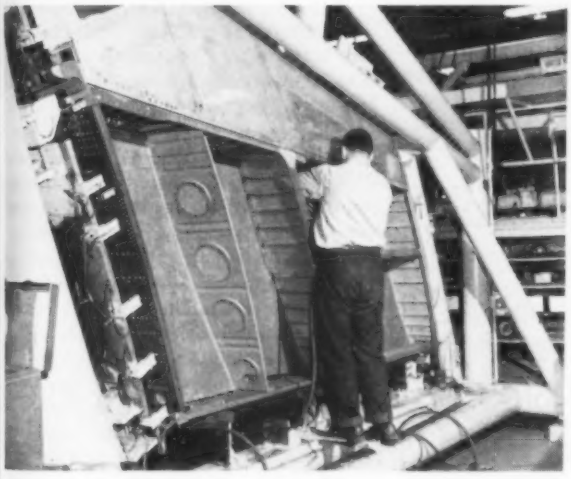


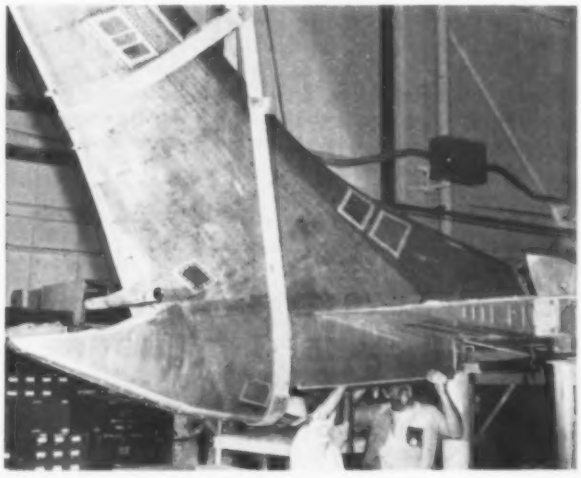
6. COMPLETED TAIL CONE is attached to the rear of the fuselage center section as one of last steps on assembly line.

How Chance Vought Builds the Cutlass

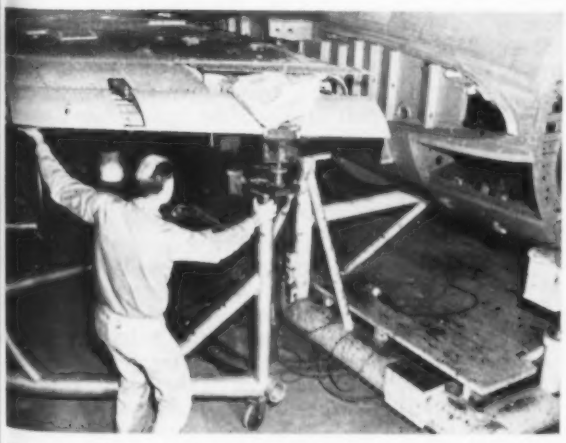
AFTER getting off to a somewhat delayed start, due to powerplant difficulties, Chance Vought's Cutlass is now being delivered to Navy squadrons off the production line. The F7U-3 model, powered by two Westinghouse J46 turbojets, is reported to have a top speed of over 700 miles per hour. The F7U will be phased out of production sometime this year, being followed by an attack version designated the A2U. The latter reportedly has a maximum speed of 50 mph less.

LANDING GEAR unit is bolted into place where outer wing panel joins the wing stub, late in assembly process.



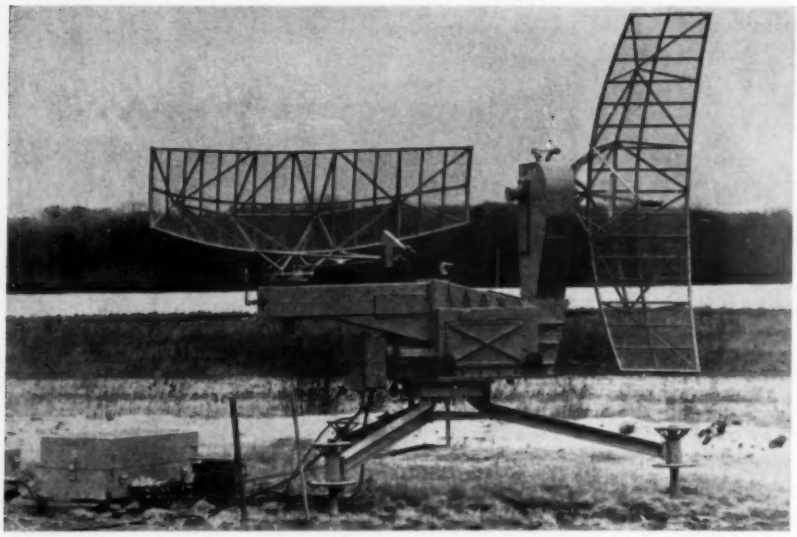


WING ASSEMBLY starts in large jig (left, above). The outer panel will be joined to the stub close to the point at which the vertical stabilizer is located (right, above). Rudder will be attached to stabilizer at extreme left of photo.



WING STUB is wheeled up to fuselage of Cutlass for joining.

VIEW DOWN LINE as F7U-3's approach cockpit area.



New Low-Cost Approach Radar Revealed

A new airport precision approach radar that shows promise of potential use as both a civil and military landing aid has been developed by the Laboratory for Electronics, Inc., of Boston, Mass.

Called SPAR, for "super precision approach radar," the new equipment by LFE will fit the role of a low-cost aid for small to medium civil airports. It has also attracted wide attention in the military services during recent demonstrations because of its tactical advantages as a mobile radar for behind-the-lines emergency airfield operations.

Basically an X-band radar operating at a frequency of 9080 megacycles, SPAR uses a B-scan type of display that presents both azimuth and elevation flight paths on a single 15" diameter scope. The equipment weighs about 1800 pounds and, when placed into production, is expected to sell for between $30,000 and $35,000.

Versatility of the LFE radar is borne out by its ability to be located anywhere from 2000 to 10,000 feet from the point of touchdown, and to be offset from the runway centerline as much as 800 feet. It can be set up at an airport in six man-hours and can be changed from one runway to another in less than 30 minutes.

Laboratory for Electronics, Inc. is located at 75 Pitts St., Boston 14, Mass.

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Transistor for Fuel Measuring Device

First major aircraft system redesign to substitute the reliability of transistors for troublesome vacuum tubes has been announced by the Minneapolis-Honeywell Regulator Co.

The new M-H system, a fuel-quantity-measuring design, is reportedly 75% lighter, 86% more compact, and requires less than one-half the power called for by systems of comparable accuracy using vacuum tubes.

By-product of the use of transistors, with their almost endless life expectancy, was the ability of M-H engineers to design and hermetically seal both the fuel quantity indicator and power unit into a single compact case. This simplifies circuitry and eliminates the need for separate amplifiers, shock mounts, and much wiring and interconnecting cable. The net result is simplified installation and maintenance.

Weight Advantage

Big weight advantage of the transistor system is apparent when compared with conventional systems using tubes. A typical two-unit transistor system in which the indicator and power unit are combined weighs about 2.28 pounds. A three-unit system of comparable accuracy using electron tubes, according to M-H, would weigh more than 5.30 pounds.

Key component in the fuel gaging system is Honeywell's own new power-type transistor, claimed to be the first built that will drive a fuel measuring indicator through the required temperature range. Tests of the new fuel system show that it will indicate accurately from temperatures of —67° to +165° and higher.

How Good Are Nonstop Fighter Tactics?

More work must be done on integrating the pilot and his equipment to maintain combat efficiency.

By WALTER A. KILRAIN

IT IS FEASIBLE even for fighters to fly 10-15 hours if the situation requires it. However they cannot do this and still maintain their combat efficiency with their present equipment."

The estimate and its qualification come from Harry W. Dorris, Jr., who has been in a position to know. He was in the position for some 14¼ hours, flying a Lockheed F-80 fighter over Korea, during which time he refueled in the air six times and flew eight missions. Since returning to work as an operations development engineer at the Glenn L. Martin Co., he has outlined both the advantages inherent in mid-air refueling as carried out during his experiment and the drawbacks that presently cut combat efficiency.

"During [the] 14 hours, I became intimately familiar with my personal equipment," Dorris observed. "As a matter of fact, my parachute seat strap made a firm impression on my posterior during this flight. I could see the acute need for redesign of cockpits and personal equipment. I could also see the great operational mobility afforded by using inflight refueling tactics."

The mobility that Dorris refers to can be exploited in several ways. With a larger supply of fuel, obtained by means of inflight refueling, the jet fighter can penetrate deeper into enemy territory, remain longer in the target area, or fly at lower altitudes while going to or from the target. These advantages, together with the fact that atomic bombs can be carried by fighter aircraft, constitute reasonable grounds for attempting to iron the bugs out of such marathon operations. "It is," as Dorris points out, "only 8000 miles from Washington across the Arctic and eastern Europe to India, or less than 14 hours in a fighter."

The actual refueling is simple enough. The fighter arrives at its rendezvous with the tanker, moves slowly up until its probe enters and locks inside the drogue of the larger aircraft, waits while fuel is pumped aboard at the rate of 600 gallons per minute, then reduces speed and breaks contact. In three to five minutes the operation is finished. It is done almost as easily at night as in the daytime.

TOO LITTLE special equipment may endanger pilots' lives, but too much, or the wrong kind, when worn during long missions, may cut combat efficiency. Above, Harry W. Dorris, Jr., in the cockpit of his Lockheed F-80, wearing flight gear after 14¼ hours over Korea.

For the pilot however, such a flight has real difficulties, which revolve around the problem of flying, alert for possible enemy action, for long periods, while hung with various items of personal equipment.

Life Vest Unbearable

"I became more and more uncomfortable as the hours passed," says Dorris. "My Mae West life vest became unbearable after five hours, so I took it off and placed it on the floor of the cockpit . . . it would have been impossible for me to have flown 14 hours with it on . . . My survival equipment was bulky and uncomfortable. Prior to the flight I had found out in relatively short flights (four to five hours) that I could not tolerate the survival vest with its contents. I removed the contents and replaced them into a makeshift cushion which I placed on the top of my dinghy to sit on.

"Another irritating item was the back of the P-1 helmet rubbing my neck. Flying alone, I was most concerned about what might be coming up on my tail, so I checked that area frequently. I did not want a MiG to sneak up undetected and shoot me down. To look directly behind you requires a good twist of the neck. This results in your oxygen mask pulling back, your P-1 helmet turning slightly on your head, and as it turns, the back edge rubs your neck.

"Another uncomfortable piece of equipment on a long flight is the main strap of your parachute that fits under your legs, which you sit on as you come down in the parachute. It is a strap about four inches wide and very heavy. This made a firm impression on my posterior during the 14-hour flight."

The answer, says Dorris, is tailor-made personal equipment instead of mass-produced items which may only come close to fitting everybody. "We pay a million dollars for a modern jet fighter so it will go higher and faster, but at the same time we pay a few hundred dollars for equipment which we hang on the pilot as best we can. . . . We must integrate the aircrewman, his personal equipment, his ejection seat, and his cockpit layout (the instruments, handles, levers, knobs to push, pull, and twist) into one entity."

Just how closely Dorris' opinion coincides with current USAF thinking was emphasized during the recent meeting of the Aero Medical Association, when Colonel Don Flickinger, assistant deputy commander for technical operations of the Air Research and Development Command, described the problem as "one with which we are currently grappling on practically a 'do or die' basis.

"Equipment which is reasonably tolerable for a two-hour fighter mission may become so uncomfortable in four to six hours as to cause an unavoidable, unpreventable decrement in performance at a critical point in the mission. This same equipment may be altered sufficiently to allow some degree of functional comfort for a bomber mission of six to eight hours, but with the added capability of several in-flight refuelings, we end up with the same crew sitting in the same work space with the same equipment, but required to remain mission-competent for 18 hours rather than the original six."

Until the resources of the pilot can be coordinated with the resources of the fuel tanks, the tactical advantages of mid-air refueling may remain more or less academic. In Flickinger's words: "Any performance capability researched and engineered into the hardware of a weapon which is over and above the capability of the crew member to use and exploit it is wasted."

• • •

TOMORROW'S AIRCRAFT: *One step closer*

Westinghouse—Rolls-Royce technical interchange advances jet development

Two world leaders in the manufacture of aviation gas turbines recently combined engineering forces through a ten-year technical cooperation agreement. As a result, Westinghouse and Rolls-Royce will exchange the wealth of design, development and production experience gained from their respective work on turbine-type power plants. This makes available an unprecedented amount of capability for jet engine development and provides the world's largest source of aircraft propulsion.

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Industry Takes Safety Initiative

Private groups establish new programs in general aviation, as CAA-CAB work is reshuffled.

By LOIS C. PHILMUS

NEW general aviation safety practices are being planned by both CAA and private associations to reflect the new government attitude toward placing additional responsibility on the user. Programs will also reflect the desire of users to take on these responsibilities.

Here's how the program is shaping up:

While CAA reorganizes its general aviation safety efforts, both the National Business Aircraft Association and the Aircraft Owners and Pilots Association are taking the initiative on educational and advisory programs of their own, as follows:

• **NBAA:** First meeting of the newly formed flight safety program committee was held recently, following a board of directors' decision to sponsor a safety program.

The committee is to work out standards and tests for selection of flight personnel, aircraft maintenance schedules either of periodic or progressive maintenance, aircraft equipment minimums, emergency procedure practices, etc. Final results will be available to corporate aircraft users as a guide.

When the program is finalized, NBAA is considering the possibility of special safety awards to members who comply 100% with procedures set forth.

William ("Rip") Strong, chief pilot of National Dairy Products, is serving as chairman reporting to the Technical Committee, headed by Ralph E. Piper of Monsanto Chemical Corp. Aviation safety research consultants will be called in for advice and recommendations.

NBAA is also considering the possibility of retaining an outside research organization to keep members up to date on all new research, developments, and safety methods.

Business flying has had an outstanding safety record, marred somewhat early this year by four major accidents. NBAA is anxious to keep the record and plans on vigorously pushing work on all facets of safety this year.

• **AOPA:** Through its Safety Foundation, AOPA has several technical programs scheduled. One of its major projects is the formation of the poor man's instrument rating curriculum. It commissioned the University of Illinois to work one out and so far 20 "guinea pig" pilots have gone successfully through the curriculum. In the near future, AOPA expects CAA and CAB to send representatives to the university to be checked out.

The next project the Foundation expects to undertake is the safety harness. There have been some engineering problems encountered in the installation of harness into existing aircraft. The association hopes to launch a research program which will solve this. It intends to investigate the technical and engineering problems involved in the installation. All possible solutions will be explored.

• **Manufacturers:** Lightplane manufacturers also are planning extensive safety education programs for customers utilizing the more complex and faster aircraft now being built. Beech has done this successfully for some time and intends to continue. Other manufacturers have been working along similar lines.

• **Civil Aeronautics Administration:** It has been learned that the Office of General Aviation Safety has proposed a reorganization of its field offices, calling for consolidation of certain work groups. Object is to get rid of "fat" in some areas and strengthen others. End result would be a smoother coordination of field offices with greater technical strength in high non-carrier traffic areas. The plan would also call for standard procedures to be employed in the regions, with closer Washington control.

Because of its new responsibility for investigating and reporting on non-carrier plane accidents in the 12,500-pound-and-under class, CAA expects statistical matter to take on a new importance.

General aviation safety field agents, now charged with official investigation of major accidents, will supply full reports. The reports go into the hands of the Office of Safety Analysis, headed by Libert Ehrman. To be filed in triplicate, one copy goes to the state aviation body concerned, one is for technical purposes within CAA, and the third is the official record for public review.

Analyses of major accidents will be sent to the regional office. In the event of a structural failure as cause

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of an accident, a report will be sent to the region where the manufacturer of the equipment is located. It will be the region's responsibility to notify the manufacturer of the findings so the cause can be eliminated.

The Office of Safety Analysis will be responsible for compiling causes of accidents. In order to get the most complete picture, the department is using an IBM accounting system. By using IBM cards and tabulations, complete details will be available on type of accidents, territories affected, equipment utilized, type of flying, etc.

For the first time, CAA feels it will really be able to pinpoint causes and effects. Safety Analysis has been doing something along these lines since 1948, but its compilations were for internal technical use.

"First Thousand" Will Go

CAB has also delegated CAA to publish the non-carrier accident findings. This will be done on an annual basis. Ehrman believes that the "first thousand non-carrier accident report" will probably be eliminated, as it does not provide a clear picture. To experiment with the most effective way of making these public reports, CAA will publish a trial run sometime in September for the first six months of 1954. Reports will go on an annual basis thereafter.

Major change in investigating and reporting methods, Ehrman feels, will be CAA's efforts to provide *all* contributing factors to an accident, rather than narrowing it down to one single cause. In this manner, Ehrman states, a much more complete picture will be presented on which to base regulations, technical assistance and enforcement.

CAA officials have expressed satisfaction over the industry's demonstration of initiative. They have made their technical staffs available for consultation and assistance when requested.

One official has stated: "We don't want to slap any more regulations on the group. Regulations are not the answer. The new programs under way —industry and pilots helping themselves and each other—is the best answer. If this attitude continues, we should be able to lighten regulations, rather than add to them. In this way, more and more people will be encouraged to fly and the non-carrier aircraft industry will be the better for it."

• • •

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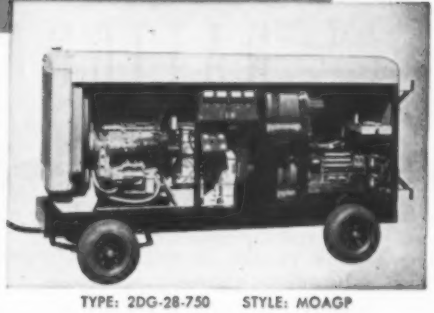

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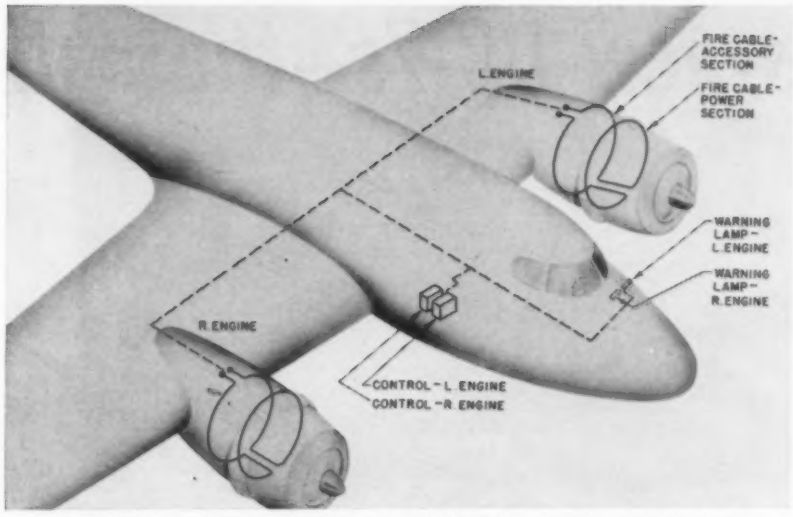
The RC26S and R37S-1 are the most widely used of Champion's many types of aircraft spark plugs.



LOCATION of various components of new Edison fire control system are shown in schematic drawing above. First production will go into Convair's F-102.

New Coaxial Cable Used in Fire System

Detection warning is set off as rise in temperature permits flow of current in Edison unit.

A NEW AIRBORNE fire detection system, combining light weight and simplicity of design with the promise of virtually false-alarm-proof operation has been announced by Thomas A. Edison, Inc., Instrument Division. First production is already under way to equip the U. S. Air Force's Convair F-102 delta-wing, supersonic interceptor, the company has disclosed.

Basically, the new Edison design is the "continuous wire" type of system built around the use of a temperature-sensitive coaxial cable instead of the individual spot detectors characteristic of most designs. Edison has designated the new development the Type B system to distinguish it from the earlier thermocouple designs.

Key to the new system lies in the coaxial cable, developed by Edison after four years of intensive research. The cable measures .070" in diameter and contains a single wire that is separated from its outer sheath by a special thermister-like semi-conductive material, the electrical resistance of which drops sharply when exposed to a rise in temperature. With the cable strung through an aircraft fire zone, such a temperature rise will result in the thermister material permitting a small current flow from the inner wire to the outer sheath. This in turn will complete the circuit through a control box to actuate the cockpit fire warning.

System features include:

• **Light Weight**—The control box, together with 100 feet of sensing cable, weighs less than 2½ pounds. Cable requirements to protect the power and accessory sections of an aircraft engine with a single-loop circuit would be about 75 feet, Edison estimates.

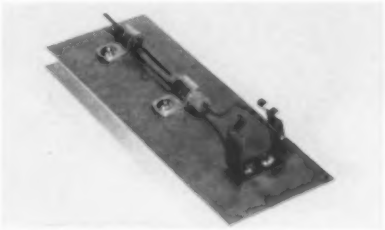
• **Design Simplicity**—Rugged relay construction permits operation from the small signal generated by the sensing cable, eliminating the need for electron tubes and transformers. Circuit operation is direct from the aircraft 28-volt, d-c power source, assuring operation regardless of other power failures.

• **False Alarm Proofing**—A low impedance electrical circuit prevents short circuits that are external to the system from being induced by humidity or capacitive effects.

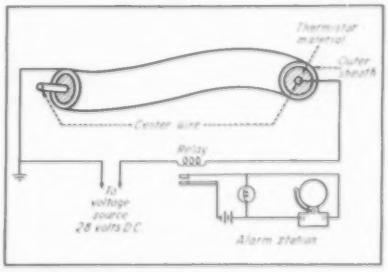
• **Fail-Safe Operation**—Continuous protection is assured even if the sensing cable is accidently severed, with only the test portion of the circuit failing to function under this condition.

• **Installation Versatility**—Cables designed to alarm at different temperatures can be connected in series in the same circuit. This does away with the need for compromising the performance of a complete detection installation just to satisfy the peculiar requirements of a localized area.

• **Quick Response**—The sensing system will alarm in 2.5 seconds and automatically re-set itself for continued service about 15 seconds after the fire is extinguished. Repeated exposure to direct flame will not affect the stability of the cable, either electrically or mechanically, Edison reports.



NEW SPRING CLAMP, in foreground, speeds maintenance of cable.



COAXIAL CABLE shown with diagram of rest of system.

Tough Cable

Another advantage of the Type B design, Edison says, is the rugged make-up of the cable and components. Although closely guarding the compound used in the coaxial cable, the company claims it is so tough that the cable can be struck on an anvil without shorting out, yet is still flexible enough to allow sharp bends during installation without fear of physical or electrical damage.

Firewall junction boxes, elbows, and other connectors have also been designed to avoid "weak spots" in these usually troublesome areas.

One particularly attractive feature of the system is a new Edison-designed snap-open clamp that will simplify routine maintenance and speed cable replacements if needed. In comparative tests run by Edison on an eight-foot section of cable, a mechanic was able to remove the entire cable in 25 seconds and to re-install it in 35 seconds. Tests with the conventional type cable clamp took nine minutes for removal and 15.5 minutes for re-installation.

Cost of the new system, Edison told AMERICAN AVIATION, is approximately $55.00 for the control unit, anywhere from $10 to $25 for the cradle or shock mount depending on design, and about $2 per foot for cable. A typical 4-engine installation would probably call for 30 ft. of cable in the power section and another 45 ft. in the accessory section of each engine.

• • •

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CRUISING AT 365 MILES AN HOUR, with a top speed of 410, United's DC-7 Mainliners are the newest, fastest, most luxurious airliners in the U. S. A. today. The nation's finest flight, "the Continental," takes only 7½ hours nonstop from the Golden Gate to Manhattan—fastest by over an hour!

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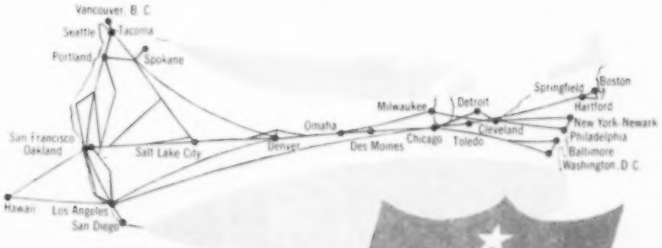

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Prevailing Airport Traffic Levels

Scheduled Airline Services

ITEM	ANNUAL VOLUME REPORTED BY GROUP 1	2	3	4	5
Flight departures	932,932	469,293	417,428	371,950	311,787
Passengers boarded	16,687,419	4,975,416	2,740,233	1,320,005	687,940
Average passengers boarded per departure	17.89	10.60	6.56	3.55	2.21
Average flight departures per airport	30,676	14,665	6,957	3,100	1,060
Average passengers boarded per airport	481,004	155,482	45,670	11,000	2,198
Airports in group	34	32	60	120	315

How Helicopters Will Divert Traffic and Fees

ITEM	AVERAGE AIRPORT GROUP VALUES No. 1	No. 2	No. 3	No. 4	No. 5
Percentage of 1953 schedules operated in DC-3's	24.8	36.5	69.3	66.1	92.9
Percentage of 1953 schedules operated in modern and other 2-engine aircraft	32.4	32.8	14.3	33.9	7.1
Percentage of 1953 schedules operated in 4-engine aircraft	42.8	30.7	16.4	0	0
Percentage of 1953 schedules operating next adjacent stage-length less than 125 miles	28.6	48.3	59.9	79.1	98.2
Percentage of 1953 schedules operating next adjacent stage length less than 250 miles	61.1	65.8	87.2	97.6	100.0
Percentage of 1953 schedules represented by flights less than 300 miles from points of origin to point of termination	10.7	13.1	21.5	6.5	21.4
Predicted helicopter diversion of fixed-wing schedules assuming mature operation (%)	35.9	46.3	42.5	38.1	60.7
Predicted diversion of landing fee revenues (%)	26.4	35.2	36.7	35.9	60.4

Airports May Lose Fees With 'Copters

Landing revenues may drop 60% for most airports serving scheduled carriers, experts warn operators.

THREE HUNDRED FIFTEEN of the 551 airports served by scheduled airlines can expect a 60.4% diversion of landing fee revenues, according to L. Welch Pogue, legal advisor to AIA's Helicopter Council, and Graham Aldrich, ATA's director of special projects. In their paper "The Heliport—A Blueprint of Change in Airport Planning Standards (AMERICAN AVIATION, April 26), the necessity for immediate heliport planning is urged.

The least affected airports number only 24. These can expect a 26.4% diversion of landing fee revenues. Thirty-two will have a 35.2% diversion; 60, 36.7%; and 120, 35.9%. Figures are based on predicted helicopter diversion of fixed-wing schedules for the airports as follows: 24 airports, 35.9%; 32, 46.3%; 60, 42.5%; 120, 38.1%; and the 315 airport group, 60.7%.

"The root of the present airport planning problem concerns the degree of fixed-wing operations which may be subject to future diversion or replacement by the helicopter. If this factor can be reasonably established then all related airport planning problems may be placed in proper perspective," the paper states (see tables).

In considering location, cost, and maintenance on proposed heliport decks at airports, the paper cautions: "It may be unrealistic to expect a landing-fee-per-schedule such as now exists for a DC-3, a Convair, or a Connie."

For heliport planning guidance, Pogue and Aldrich have set up anticipated timetables on availability of flight equipment, existence of adequate heliports, and availability of proper navigation equipment, as follows:

Pogue

Aldrich

• **Multi-engine commercial helicopters:** 1954—production committed to military requirements; 1955—accelerated test flights, first multi-engine commercial production models; 1958—limited quantities available for carrier operations; 1960—available in fleet quantities; and 1965—era of technical obsolescence and availability of improved transport types.

• **Heliport availability:** 1954—aside from available areas on established airports, no concerted heliport construction program has yet been initiated; 1955—in-town heliports in planning stages, awaiting results of accelerated flight tests; 1958—construction of in-town and airport heliports under way at major traffic centers; 1960—"city-side" heliports at secondary traffic points under construction and airport heliports nearing completion; and 1965—adequate.

• **Air navigation aids:** 1954—terminal area aids not available with en route aids in "will-do" category; 1955—terminal "black boxes" in research and testing; 1958—limited quantities of elementary terminal "black boxes" in production, advanced boxes in accelerated research and testing, and en route aids considered adequate; 1960—terminal and en route aids adequate; and 1965—adequate.

"Appraisal of these time factors indicates that helicopter diversion of fixed-wing airport schedules will be without deep significance until the period of 1960-1965," the paper observes, but warns, "despite the apparent 'grace period' of nearly six or more years, it is incumbent upon airport operators to begin heliport planning without delay!"

The next decade will provide the airlines with an effective means of competing with surface carriers for the short-haul, intercity, common-carrier passenger market. The paper observes: "If properly exploited, and this includes high frequency service, time-table conformance, and terminal convenience . . . there is reason to believe that the 1965 airline traffic level will be appreciably higher with respect to revenue passengers. . . ." • • •

TAG Asks Act Revision

The Defense Department and the CAB are pursuing policies that make revision of the 1938 Civil Aeronautics Act a necessity, in the opinion of the air freight carriers of the Transport Air Group. L. R. ("Mike") Hackney, TAG executive v.p., has cited alleged Defense Dept. lack of awareness of "the need for maintaining civil cargo transports" and "restrictive policies of CAB."

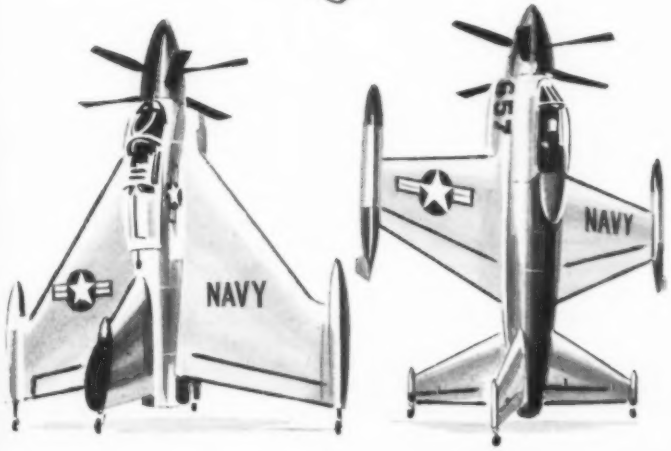
The U.S. Navy selects

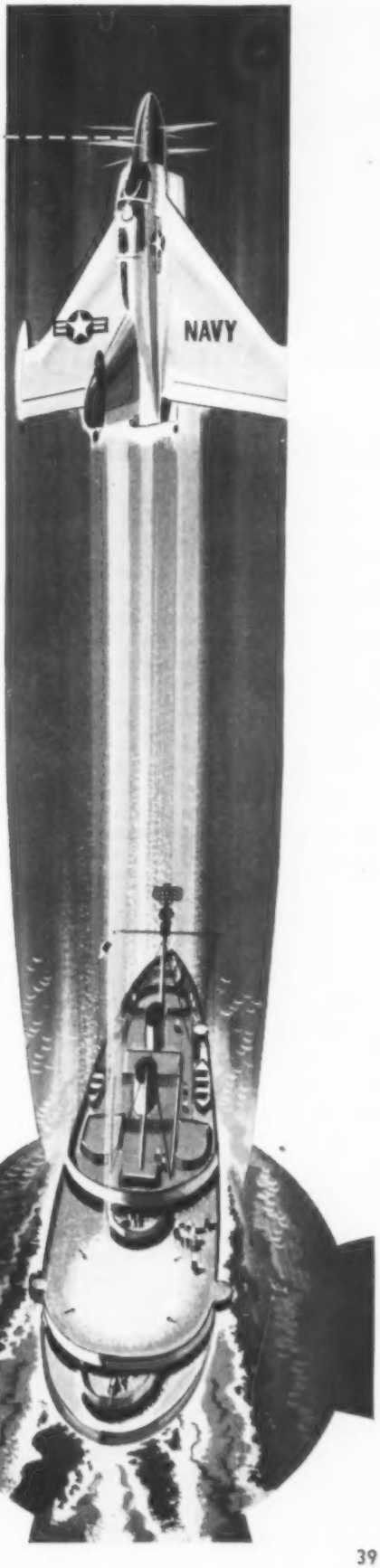
TURBOLECTRIC PROPELLERS

for the NEW

CONVAIR XFY-1 and LOCKHEED XFV-1

vertical take-off fighters





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ONE CONFIGURATION (35 tourist and 24 sleeperette seats) is expected to handle 60% of both tourist and first class traffic in Pan American's combined service. Movable bulkhead separates the two classes of passengers, can be set in any of four locations

Pan Am Inaugurates Combined Service

Schedule frequency is main spur to tourist/first class operations; flexible seating is key.

By FRED S. HUNTER

PAN AMERICAN World Airways may go 100% combined service in the Pacific before the summer is over.

This would mean conversion of the Pacific-Alaska division's full fleet of 16 Boeing Stratocruisers, together with the DC-4 equipment it uses on connecting flights. Possible exception would be the Douglas DC-6B's operated on the Alaska routes, which could come later.

Pan Am launched the combined service on three Pacific routes on April 1 when IATA approval of tourist tariffs west of Honolulu became effective. It is now running a comprehensive survey of passengers on these routes to determine whether they like it, and if they don't, what aspects they object to. If the survey is at all favorable, the Pacific-Alaska division is set to go all-out.

Big reason PAA is anxious to make the combined service, in which standard fare paying passengers share the same aircraft on the same trip with coach passengers, work in the Pacific is frequency of service. Schedule frequency, Col. Clarence M. Young, executive vice president of Pan Am's PAD, points out, is one of air transportation's great assets, but it is difficult to achieve on routes where the traffic is thin.

For example, two flights per week are ample for the traffic between the U.S. and the South Pacific. Dividing the schedules into one standard fare and one tourist would cut the frequency of service to once a week in either bracket.

With the advent of tourist tariffs west of Honolulu, PAA increased its service between the U.S. and Tokyo to seven round trips a week, three tourist and four first class. But combined service on this route would mean a daily service for both classes.

The three routes where Pan Am has launched the combined service are: San Francisco and Sydney, via Honolulu; San Francisco and Manila, via Honolulu; and Seattle/Portland and Honolulu.

Five Boeings have been modified to the combined configuration at a cost averaging $100,000 per airplane, exclusive of seats. More than six months of planning and 12,500 hours of engineering effort went into the project.

Moveable Bulkhead

PAA is hopeful it will be able to make its combined service work where others have failed because it is making it completely flexible. It also maintains a clear and definite demarcation between the two types of service. The key is a moveable bulkhead.

This is a solid partition effectively separating standard fare from coach passengers. It consists of a plastic impregnated honeycomb paper, sandwiched between sheets of aluminum alloy covered with a formica "hardwood" veneer. It can be tapped in at any one of four "stations" in the cabin or it can be removed entirely. Moreover, a second bulkhead can be inserted to bring about a three-way division of the cabin for standard passengers, tourist passengers, and cargo.

LOUVERED DOOR separates passengers.

These are the flexible compartment and seating arrangements made possible by moving the bulkhead:

- **54 tourist** and 14 sleeperette passengers;
- **35 tourist** and 24 sleeperette passengers;
- **27 tourist** and 28 sleeperette passengers;
- **20 tourist** and 32 sleeperette passengers;
- **81 tourist passengers;**
- **46 sleeperette passengers;**
- **41 tourist and 14 sleeperette passengers** plus 270 cu ft. of auxiliary cargo forward. There are also several alternate configurations retaining the 270 cu. ft. forward auxiliary cargo compartment but adjusting the number of tourist and sleeperette seats.

Cabin configurations may be changed en route by keeping spare bulkheads and spare seats in supply at main points. Thus, a schedule might depart from San Francisco for Sydney with 20 tourist and 32 sleeperette seats. At Honolulu, to meet a change in traffic demand, it could be changed to 35 tourist and 24 sleeperette seats. At Fiji, the 270 cu. ft. cargo compartment might be added, with the seating arrangement changed to 41 tourist and 14 sleeperette seats, or one of the other configurations fitting in with use of the forward auxiliary cargo compartment.

Feature of the door in the bulkhead is a louvered shelf arrangement permitting one stewardess to carry food trays from the galley to the door and slide them onto the shelves, where a second stewardess working in the tourist compartment picks them up and serves the tourist passengers.

The seats were specially designed for the combination planes, not only to incorporate new standards of comfort but to meet the logistics problem

Weight had to be held to a minimum and backs had to fold forward and down into a flat "package" to facilitate removal and storage.

The sleeperette seats were developed to Pan Am's specifications by Hardman and the tourist seats by Aerotherm. The former fold to a thickness of 17" for shipping between stations; the latter to 15". The seats are attached to tracks.

James Weesner, PAD operations manager, says any change of bulkheads and seats can be made in 90 minutes.

The combined service Boeings retain seven berths, as compared to 13 in the standard planes. Other engineering changes include the installation of four windows and two emergency exits, flexible reading lights in which the beams can be directed to meet changing needs, and a portable cloakroom.

A major project was the rearrangement of lavatory facilities, which wasn't worked out until complete wood mockups had been built. Two toilet and two lavatory compartments are in the rear of the airplane for first class passengers and two more are located forward for tourists. Latter arrangement puts tourist seats in the propeller line, and this in turn required the installation of additional soundproofing in this section of the airplane.

Embarking on a program calling for seating arrangements that might vary not only from flight to flight but even on the several legs of a single flight created a logistical problem of no mean proportions. Out of this has grown something new in the airline business—a "configuration control unit."

It is the job of Configuration Control to advise each station of the seating arrangement on each flight, or segment of flight, and to make sure that the stations where seats and bulkheads are pooled have enough of everything to meet the ever changing demand.

For six months before putting in its combined service PAA's Pacific-Alaska division operated a "paper airline" to plot day-to-day fluctuations against seasonal trends and directional trends. The division came up with three important conclusions:

• **Roughly 60% of the volume** of both classes can be handled by one configuration, a 59-passenger airplane with 35 tourist and 24 sleeperette seats.

• **Because of this,** the need for emergency transfer of seats by air from one station to another can be held to a minimum.

• **The traditional airline approach** to supply and demand can be reversed. Instead of limiting ticket sales flight by flight, it will now be possible to say to Reservations: "Go ahead and meet the travel demand and we'll supply seating that will fill the bill." • • •

West Coast Talk

By Fred S. Hunter

North American Aviation has started sending personnel to Florida to build up its organization at Banana River, indicating its long range guided missile, the Navaho, is about ready to appear on the scene. . . . Beech's new Super 18 is scheduled to be along in July or August with a price tag of $98,950. . . . United Air Lines is installing Sperry A-12's in its DC-7's and Dick Petty, vice president in charge of operations, estimates the automatic pilots will save up to 15 minutes on trip time on coast-to-coast nonstops.

•

Bill Lear will CAA type certificate the Learstar (modernized Lockheed Lodestar) under the new transport requirements of 04b. . . . It shouldn't be too much of a surprise if the Hughes Falcon missile should find its way onto Northrop's F-89D as well as Convair's F-102, the Northrop job being a husky which ought to be about right for an air-to-air missile firing platform. . . . Jack Dopper, ticket agent in charge for TWA at Long Beach, is 6 feet 11 inches, which ought to make him the tallest on the coast.

•

Douglas spent nearly $800,000 for a 7000-ton hydraulic press to make it easier for the Long Beach division to stamp out big pieces for the RB-66 and the C-133. . . . The Air Force has been doing some talking about replacing the R-1300 engines in its T-28A trainers with the more powerful R-1820's, which are said to be working out much better in the Navy's T-28B's. . . . When Western Air Lines takes delivery on its four additional Douglas DC-6B's, it will switch the rest of its Convair 240's to its inland routes.

•

Lockheed has a WV-3 coming up for the Navy, which will be equipped with improved warning gear. . . . Bert Fink has discovered that TWA in Los Angeles has a meteorologist named (Don) Gales and another one named (E. Sutton) Frost, and he felt kinda unhappy about it until he located an outside salesman named Merryweather. . . . United Air Lines has cleaned up most of the hydraulic and cabin pressure troubles on its Convair 340's and, as a result, is setting 'em up in its summer schedules for a daily utilization of eight hours.

•

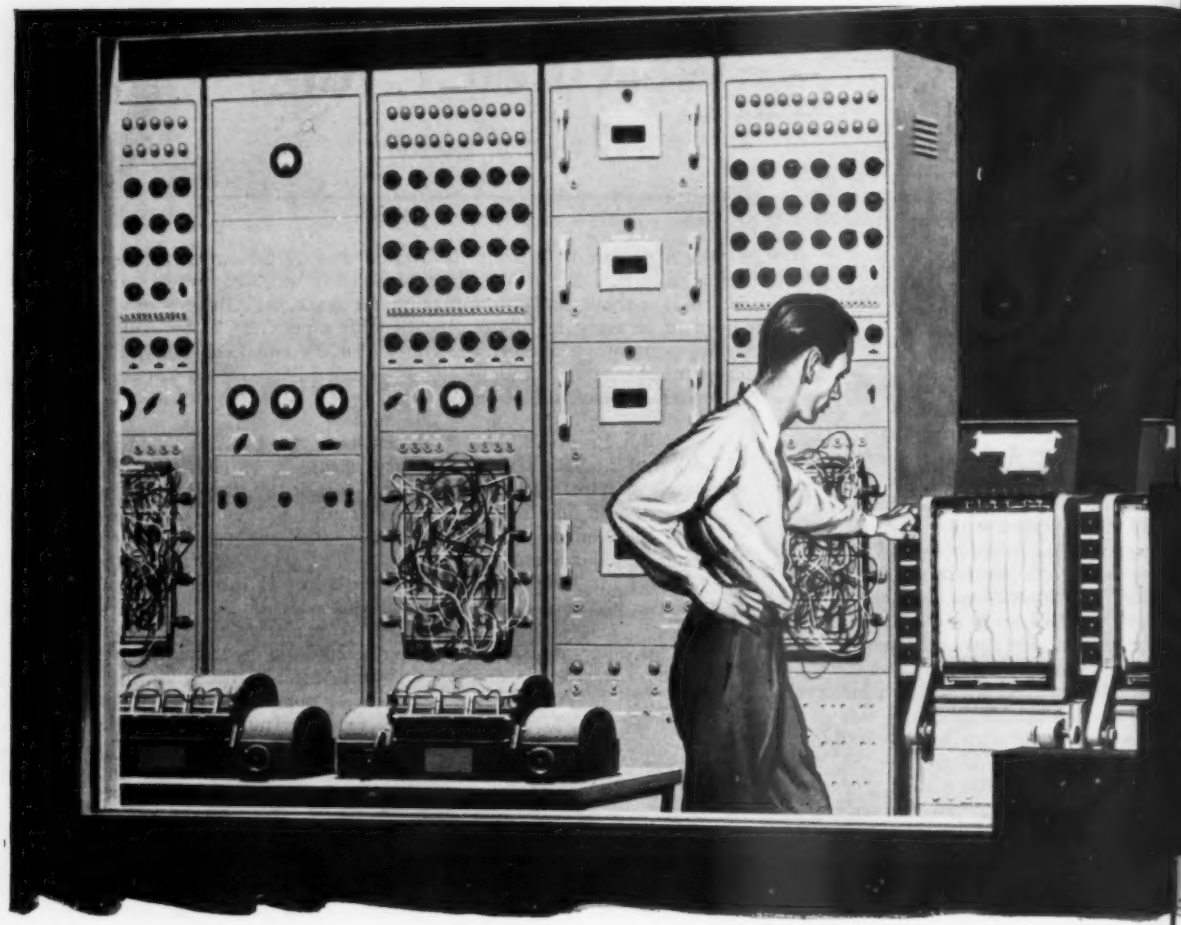
Pan American's long range DC-7's will have fuel capacity of 6400 gallons and Douglas is now testing the installation with dummy "saddle" tanks mounted on a plane now out in the yard. . . . There has been no official announcement that Northrop's F-89D's are operating at higher altitudes than before, but the company is now providing its test pilots with T-1 pressure suits. . . . First production F-102's are being called YF-102's (like prototypes) because the Air Force decided it would be simpler to designate them this way, since they'll be used for test purposes, than to call them F-102A's and then switch to F-102B.

•

E. E. Dryer is the latest Los Angeles-based captain to reach the 25-year mark with American Airlines—as of May 1. . . . When Norman Larson moves from Lockheed Air Terminal into his swanky new $200,000 sales and service hangar at the San Fernando Valley Airport, one thing he'll have is a big enough parts department, which most distributors don't. . . . Tom Summers, Jr., president of Summers Gyroscope, nabbed the second Corvette delivered in Los Angeles. . . . CMA sold more tickets and took in more money at Tijuana last year than at any other point on the line, including Mexico City.

•

Ryan Aeronautical takes no little pride in the fact that **Maj. Chuck Yeager** soloed for the first time in a Ryan PT-21 when he was an aviation student (not a cadet) at the Ryan Hemet training school in 1942. . . . **Willard G. Eldridge,** who flashed the first word to Pan American that the Japs had attacked at Pearl Harbor, recently observed his 25th anniversary with the airline. . . . American Airlines will establish DC-7 nonstop service between Los Angeles and Washington sometime next month.



INVISIBLE JET FIGHTER MAKES TEST FLIGHT

This Grumman jet fighter is invisible. She is electrons. Yet day after day, she makes supersonic flights through an electronic sky.

Actually she is an electronic brain by name of REAC (Reeves Electronic Analog Computer) directed by a group of brilliant human brains. The latter convert the mathematics of the aircraft into a language they and she understand. They "tell" her everything they know about the new fighter design through wired panels and curves wired on revolving drums.

The cockpit with its human pilot is plugged in. At a signal he takes off and climbs to fifty thousand feet. The electronic air is smooth up to the transonic range where sound waves pile up until the air misbehaves. Once through, the air is smooth again, and they are ready to test a combat maneuver at supersonic speed.

"Now decelerate."

The pilot extends speed brakes. All eyes watch the instruments, and the reactions recorded on moving graph paper.

These performance data, gained months before actual flight tests, help check designs created with results from other Grumman research. One reason Grumman planes are ready in quantity when needed.

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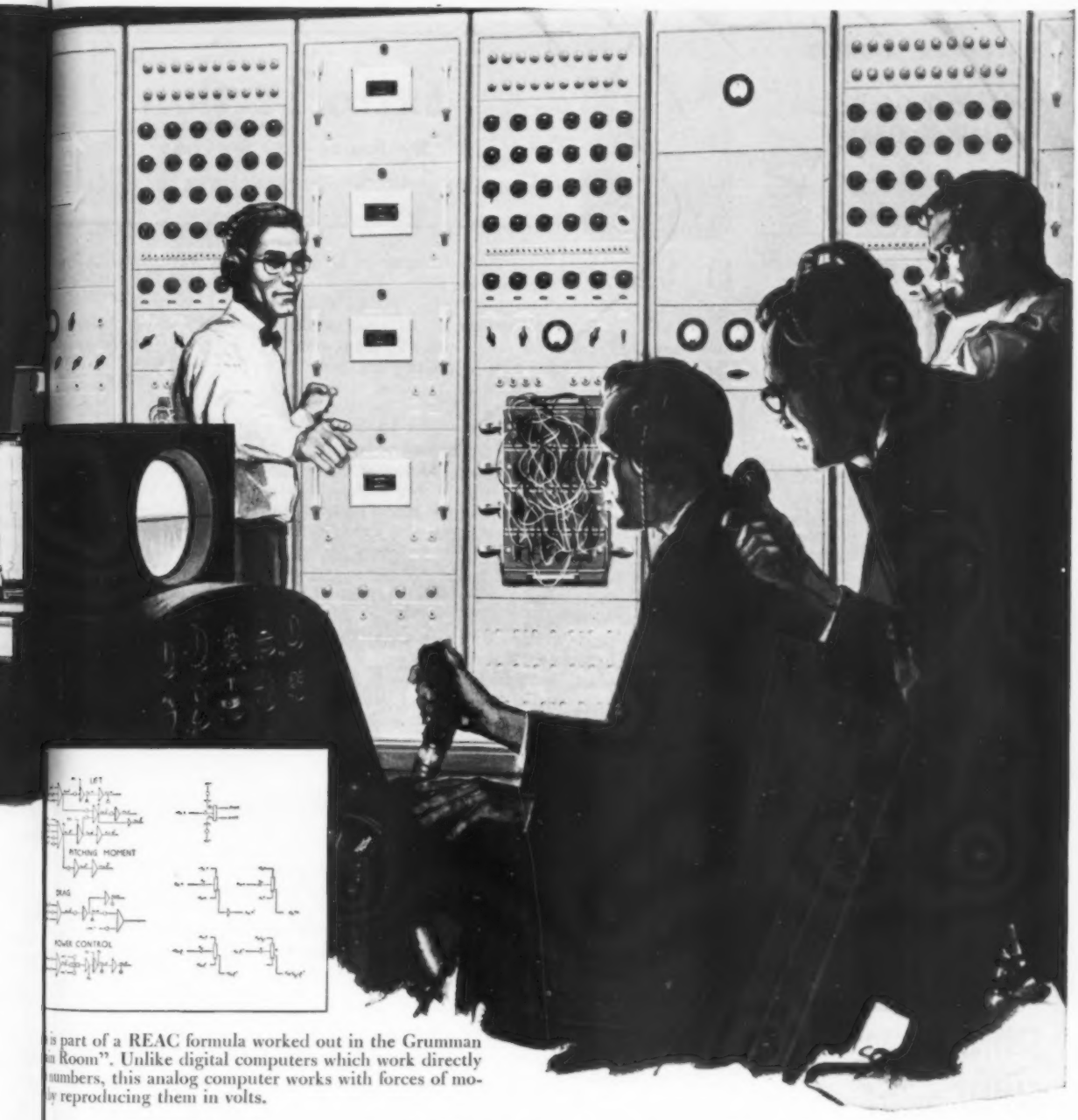
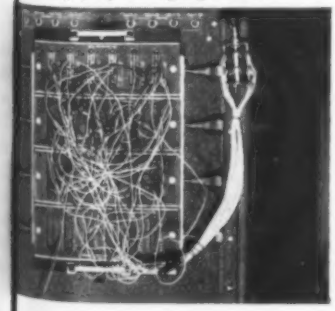
Designers and builders of the Cougar jet fighter, the S2F-1 sub-killer the Albatross amphibian, metal boats, and Aerobilt truck bodies.



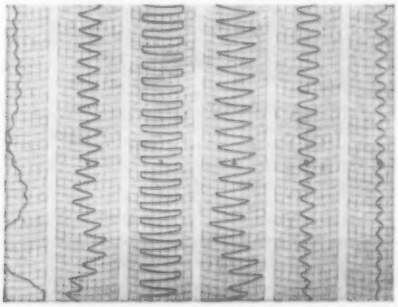
is part of a REAC formula worked out in the Grumman
n Room". Unlike digital computers which work directly
numbers, this analog computer works with forces of mo-
y reproducing them in volts.

omputer is "told" the facts of
roblem through miniature
lboards. A different problem
e made known to the computer
y, simply by changing boards.



Some data, like wind tunnel results, are fed into the computer from revolving drums. The computer gets its information electrically from copper wires glued over penciled curves.

These are typical REAC answers. Engineers translate these squiggles into design information. Sometimes thousands of such answers may be required to solve any one of the many design problems.



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Extra Section

By James Hay Stevens

London Technical Editor

BEA now has the graceful Ambassador on all London-Paris services, which are all tourist except the mid-day Silver Wing. First and last schedules of the day qualify for additional off-peak reduction, $2.80 each way. The trouble is that to get to or from the Waterloo air terminal or the airport at the early or late hours involved requires a cab costing $10 from a suburb, because no public transport is available. Flight time is around one hour 20 minutes—just the same as for the coach trip from Waterloo terminal to the airport.

•

The Air France bus from Le Bourget is a lot less comfortable than the new BEA one-and-a-half decker, but the trip is much livelier. True, the roads are wider and straighter, but no English driver will ever master the technique of overtaking a car that is already pulling past a truck, which in turn is rounding a stationary dung cart—with traffic approaching fast from the opposite direction.

•

The "Journée Louis Bleriot" is an annual event celebrated by the Royal Aeronautical Society and the French association of aircraft technicians (AFITA). It is held alternately in London and Paris, the guest from the English society speaking in French at Paris, and vice versa. This year the guest was **Raoul Hafner** of the Bristol Aeroplane Co. Ltd., who gave a paper entitled "The Dominion of the Helicopter," which he introduced himself, before saying that his knowledge of French was really restricted to terms of gallantry and turning it over to a Frenchman to read. After the lecture came "le cocktail," which is a closer packed and even more cacophonous gathering than the anglo-saxon variety, the banquet, and the (very, very long) speeches.

•

While I was visiting Toulouse recently, the prototype Caravelle fuselage came off the assembly jig. It was removed, weighed, and mounted in another part of the assembly area in one hour. Weight was within two pounds of the estimated 5800 pounds in the bare state, without floors, windows, or doors. Enthusiasm runs high at SNCA du Sud-Est over the prospect of completing the first French jet transport. Chief Engineer Pierre Satre told me that they are working nights on assembly to keep ahead of schedule. Engineering design of the structure inspires confidence, and there are many novel and ingenious detail features.

•

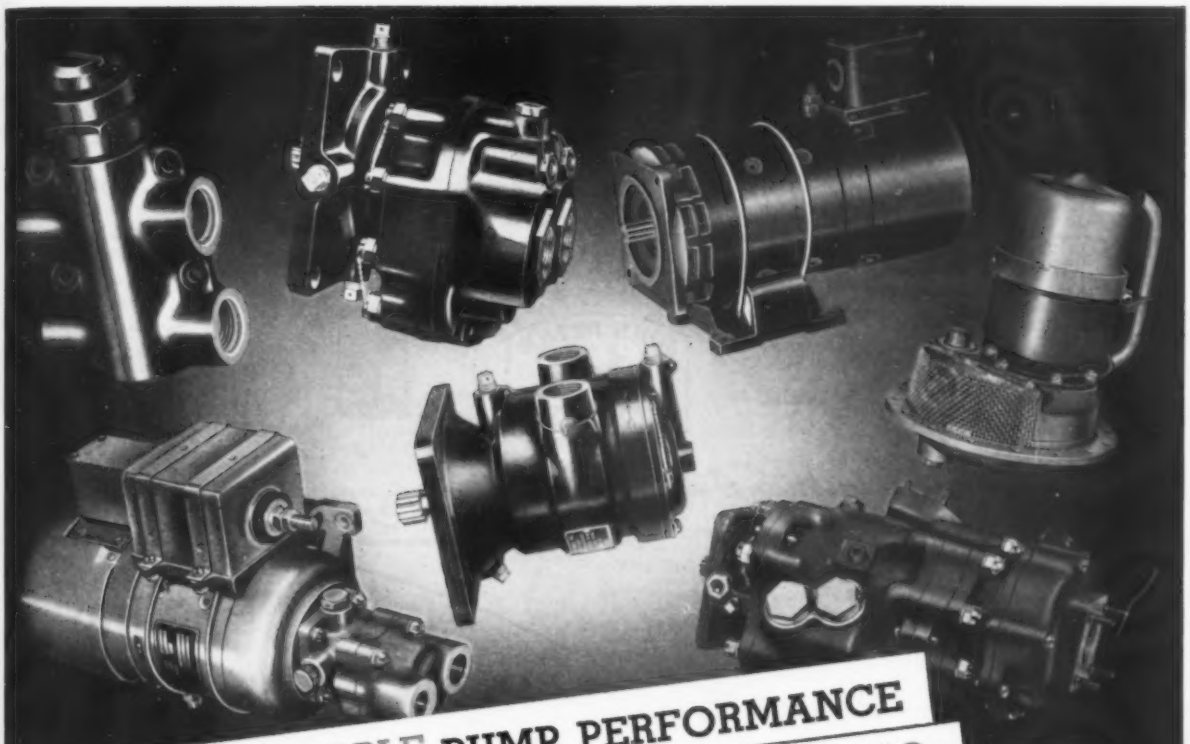
At night the Fouga CM 170R Magister is doing a lot of test flying from Toulouse-Blagnac Airport in the hands of **Jacques Grangette,** chief test pilot. Ample power from two Turbomeca Marbores gives this jet trainer rapid acceleration and a short take-off. Handling qualities reproduce in miniature those of operational jets, with most of the danger spots smoothed out. One hundred Magisters have been ordered for Armeé de l'Air training, after fierce competition with the Morane-Saulnier Fleuret.

•

Yves Gardan, pilot as well as designer, has made a little beauty with his SIPA Minijet. Amazingly simple as an engineering structure, this twin-boom jet trainer flies like a dream and can do all aerobatics without loss of altitude. It was demonstrated to me with a cloud base of a thousand feet, and a spin was the only maneuver omitted. Drawback to a private owner would be the low acceleration and the need for a runway of at least 500 yards—and with very clear approaches. Price is to be $22,400 fully equipped.

•

John Jakimiuk is highly pleased with the Baroudeur's progress. Criticisms of ground mobility have been fully met; the airplane can be taxied with precision, whether on skids or dolly, and requires the jeep only for actual loading onto the dolly, which takes less than two minutes. A skid landing has been made in mud that bogged the towing truck. Jakimiuk says he has rendered obsolete man's oldest invention, the wheel.



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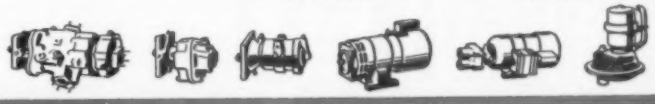

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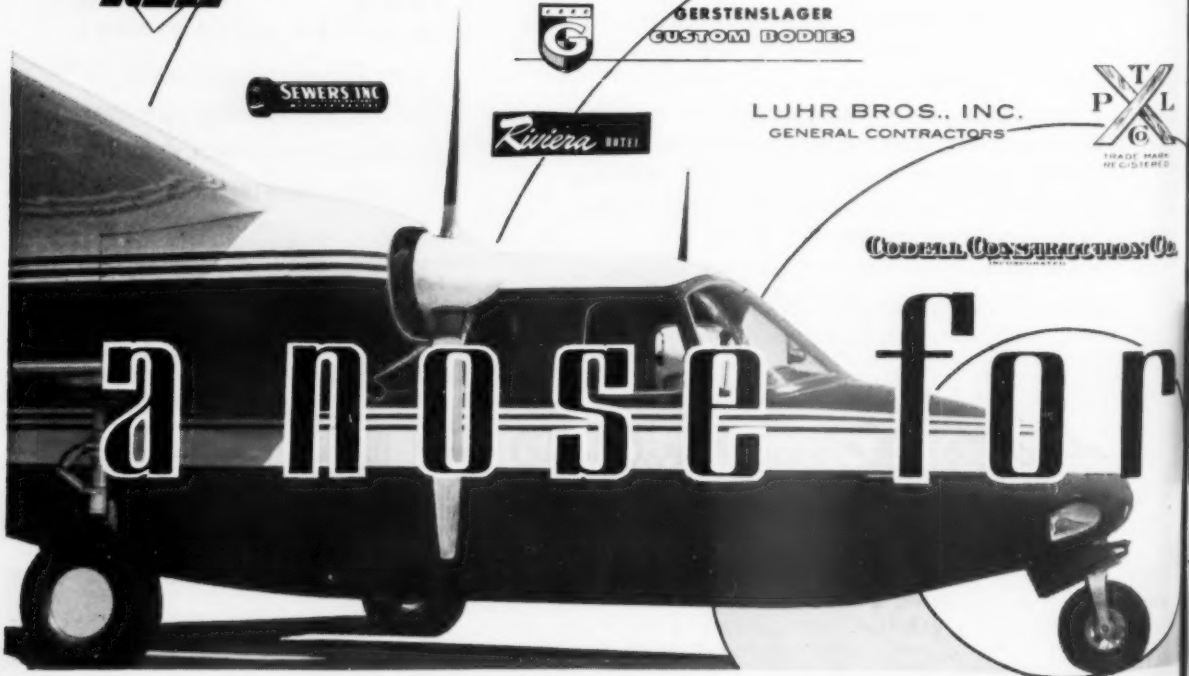

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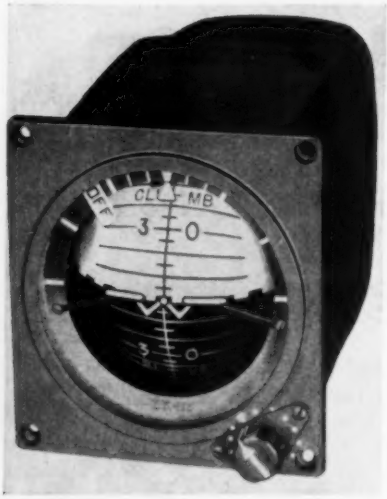
New Products



Attitude Indicator. A new pictorial vertical attitude indicator, which applies the concepts of human engineering to give the pilots of high-speed jet aircraft faster recognition of their flight attitude during combat operations, has been developed by Lear, Inc.

For precision instrument flying, the new remote reference instrument is also said to permit reading of exact angles of climb, dive or bank to within one degree. Advantage of this combined quick-recognition and reading accuracy also means improved indication for GCA and ILS approaches, instrument climb-outs, and bombing or rocket runs, Lear says.

Feature of the new unit is its display which, instead of the conventional symbolic dial face, presents a miniature reference airplane against a moving background closely simulating the earth-sky background that a pilot would visualize in flight. Background sphere on the Lear unit is painted gray (sky) and black (earth) with a white line indicating the horizon.

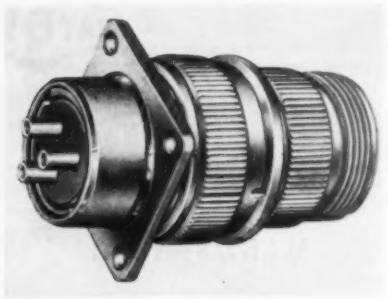
New Lear indicator is called the model 978K indicator and operates with the standard Lear K-4 VGI control. Spherical background of the pictorial indicator is free to move a full 360° in roll without obstruction and is capable of multiple rolls without error accumulation.

High response servo systems can follow pitch and roll rates up to 180°/second, and, according to Lear, the most violent acrobatic maneuvers are well within the performance capabilities of the instrument. New booklet available.

Address: **Lear, Inc., Dept. AAP, 110 Ionia Ave., Grand Rapids 2, Mich.**

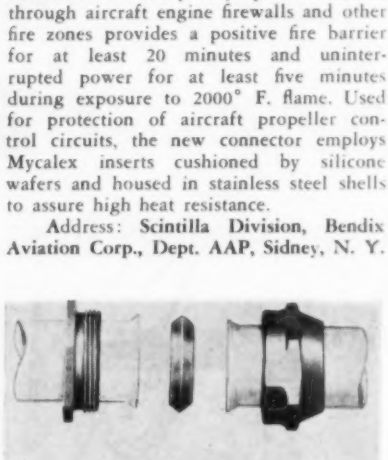
Test Bench. For laboratory or production line, new test equipment dolly provides two 24" by 24" steel shelves 19¾" apart, which can be adapted to a variety of requirements. Accessories include a drawer with lock provisions which can be attached to either shelf; five-position bar lift which tilts equipment such as oscilloscopes for easier observation; and power outlet strip with four outlets so that a single cord brings power to all equipment on the dolly.

Address: **Browning Laboratories, Inc.**, Dept. AAP, Winchester, Mass.



Connector. New high temperature connector to carry key power circuits through aircraft engine firewalls and other fire zones provides a positive fire barrier for at least 20 minutes and uninterrupted power for at least five minutes during exposure to 2000° F. flame. Used for protection of aircraft propeller control circuits, the new connector employs Mycalex inserts cushioned by silicone wafers and housed in stainless steel shells to assure high heat resistance.

Address: **Scintilla Division, Bendix Aviation Corp., Dept. AAP, Sidney, N. Y.**



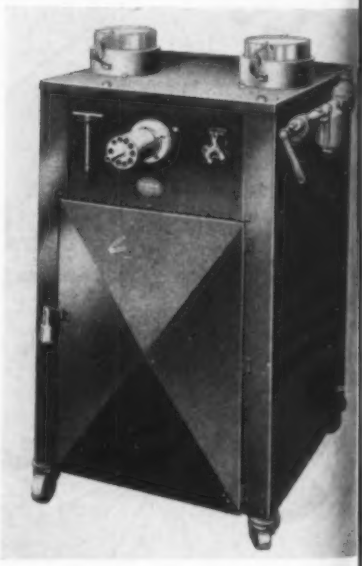
Duct Connector. A new rigid aluminum duct connector unit which offers a 62% reduction in coupling length and a 68% saving in weight over standard AN coupler designs for a 2" tube size has been introduced by Rubber Teck, Inc.

The new coupler is being sold under license with the Douglas Aircraft Co. It consists of a nut, coupling, and insert ring, all of aluminum construction. Assembly conforms to specification MIL-F-5506A and operates satisfactorily in temperatures up to 500°F.

Address: **Rubber Teck, Inc.**, Dept. AAP, 19115 S. Hamilton St., Gardena, Calif.

Miniature Motor. An electric motor for operation of hydraulic valves and driving stabilized gyros in guided missiles delivers 1/30 horsepower at 6000 rpm. Dimensions are 1⅛" dia. by 2¼" long, and continuous duty life is one hour.

Address: **John Oster Manufacturing Co., Dept. AAP, Racine, Wisc.**



Mixing Unit. A new mixing unit for preparation of Pro-Seal compounds for aircraft fuel tanks and pressurized cabin sealing is being marketed by the Coast Pro-Seal & Mfg. Co.

Called the Master-Mixer, the unit is said to produce one pound of material per minute at 90 psi air pressure; capacity is described as five to seven gallons per hour.

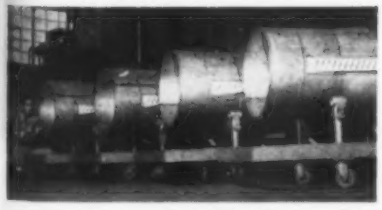
Principle advantage claimed for the new mixer is the elimination of all possibility of error in preparing Pro-Seal two-part materials. A four-pound companion hand gun for application of the compounds is also being produced.

Address: **Coast Pro-Seal & Mfg. Co.**, Dept. AAP, 1507 Grande Vista Ave., Los Angeles, Calif.

RYAN
BUILDS THE HOT PARTS FOR JET ENGINES

RYAN-BUILT TURBOJET PARTS AND AFTERBURNER

The startling performance of America's great new fighters and bombers depends largely upon the knowledge and skill of the manufacturer of their jet engine components. These rugged "hot parts" must be built to jewel-like precision and exhibit amazing strength under extremely high temperatures.



Ryan Afterburners for Westinghouse J-46

Ryan is a pioneer in this field, developing the first American jet engine afterburner in connection with the Navy's first jet plane, also built by Ryan. Today, Ryan leads in the fabrication of sheet metal turbojet components and afterburners because of a unique combination of advantages: long experience in high temperature metallurgy – extensive know-how in forming, welding and machining heat-resistant alloys – the industry's most modern array of high precision machines. Few plants anywhere have the necessary equipment, methods and know-how for this specialized work.

With these facilities, Ryan is building afterburners and jet engine parts for General Electric, Westinghouse, Pratt and Whitney Aircraft, Wright Aeronautical and others. Ryan's $4 million worth of modern production tools produce high temperature jet engine components used in North American F-86 and F-100 Sabres, Boeing B-47 and B-52 Jet bombers, Convair F-102 fighters, Douglas F4D Skyray fighters and A3D attack bombers and McDonnell F-101 fighters. Currently, Ryan is building six different types of afterburners.

As the only maker of jet engine parts which also designs, builds and flies jet aircraft, Ryan is uniquely qualified for this exacting work. In virtually *every* field of aircraft development and production, Ryan is better prepared to solve the complex engineering and fabrication problems posed by the high speed air age.

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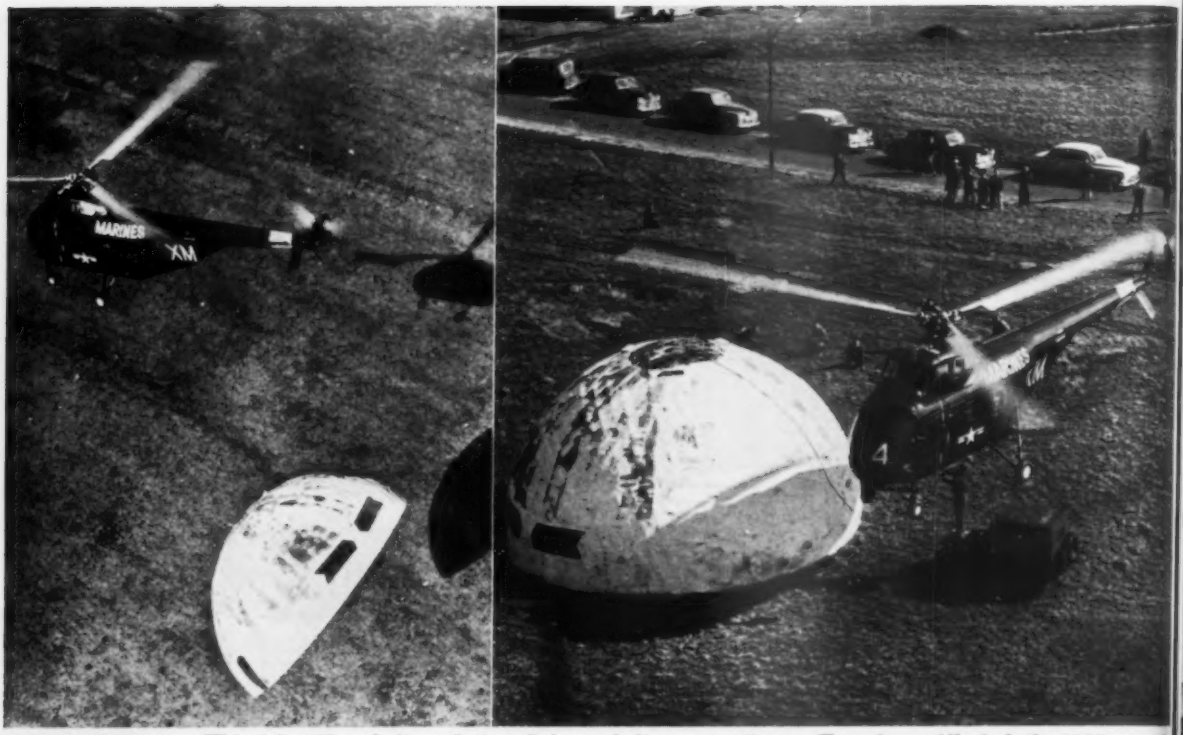

FLYING BARRACK—This igloo-like shelter, designed for Marine Corps use in the field, can be transported by air. The dome is 18 feet high, 36 feet in diameter, and can shelter up up to 40 men. Even in a stiff wind, the 1000-pound plastic-covered hut can be moved easily from place to place by a Marine Corps HRS Sikorsky helicopter.

AROUND THE WORLD WITH SIKORSKY HELICOPTERS

WILDERNESS WINGS—A damaged light airplane was "rescued" from the frozen surface of Thunder Bay on Lake Superior by a chartered Sikorsky S-55 helicopter, and flown 25 miles to a repair base. Ambank Airlift, Limited, of Ft. William, Ontario, operates the new Canadian charter service, with S-55 equipment exclusively.

PRACTICE MAKES PERFECT—This unusual photo shows a Sikorsky H-19 helicopter over the Han River near Seoul in a simulated rescue of a downed pilot. The practice mission by a U.S.A.F. Air Rescue crew was similar to nearly one thousand actual rescues during the Korean war, made on land and at sea behind enemy lines.

HELICOPTER EXPRESS — Regularly scheduled Air Express flights in Southern California form a new service started last December by Los Angeles Airways, Inc., and the Air Express division of Railway Express Agency, Inc. Big Sikorsky S-55s, like that above, and S-51s, are used for the speedy shuttle to cities as far inland as San Bernardino.

SIKORSKY AIRCRAFT

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One of the Divisions of United Aircraft Corporation

Maintenance Bulletin Board

Clary Pulley Used in New Prototypes

New all-metal flight control pulley developed by Clary Multiplier Corp. is being widely used in nearly all of the new prototypes, according to Bruce H. Atwater, general manager of the company's aircraft hardware division.

One prototype, employing approximately 190 pulleys, accomplishes a weight saving of 14 pounds, as compared to conventional phenolic pulleys. All of the metal pulleys now in production at Clary weigh less than AN specification requirements, while flange strength, bonding strength, and sheave strength all exceed specifications, Atwater said.

The Clary pulleys are precision machined from solid bar stock 24ST aluminum. The sealed bearing is pressed directly into the sheave. No sleave or insert is used. This reduces weight and provides greater strength and resistance to off-center pull.

After the bearing is pressed into position, both sides of the sheave are rolled over the mating edges of the bearing, instead of just one side. This provides a safer union between the sheave and bearing, reducing the possibility of the bearing and pulley parting under off-center strain. The seal is Teflon and the grease is Dow Corning 44.

Clary's newest development in metal pulleys is the incorporation of a specially designed Fafnir high-temperature bearing which will withstand 350° and up to more than 425° for a short period. This is in response to increased demand from aircraft designers for heat-resistant bearings for control pulleys, which have to be located in close proximity to the hot sections of jet engines.

New anchor nut holder developed by Howard V. La Rue, Northrop Aircraft, Inc., tool engineer, during production of the F-89 Scorpion is being produced and marketed by E. H. Stau Co., Los Angeles, under exclusive Northrop license.

THICKNESS of engine exhaust header is measured with Magne-Probe.

New Magne-Probe Measures Thickness

A completely new version of the Magne-Probe, originally developed in 1950 by the American Instrument Co. of Silver Spring, Md., for airline inspection of engine exhaust systems, promises to extend its utility far beyond this initial use.

In recent developments, the company has designed and entered production with a new model of the instrument that will now measure both embrittlement and erosion thinning of exhaust parts. But even more significant, the new Magne-Probe will measure thicknesses of nonmagnetic metal sheet stock up to ½" thick at distances as great as 30" from an accessible edge. It will also measure paint and plating thicknesses on steel.

This new feature, AIC officials feel, represents the first satisfactory method of measuring metal thickness. They explain that previously only X-ray and Beta-ray gages, both very expensive, could measure thicknesses distant from an accessible edge.

The new Magne-Probe technique calls for use of a ½" diameter steel ball which is inserted into the exhaust system to contact the inner metal surface. Then, with the probe of the instrument located opposite the ball on the outside of the stack, the Magne-Probe meter reading will indicate wall thickness within .001". For measurements at the depths of pits or grooves, a .041" wire tip is used instead of the steel ball.

Key feature of the device is that its accuracy increases as metal thickness decreases. This, in the case of exhaust system inspection, is of paramount importance since the potential of failure becomes greater with thinning exhaust parts.

Airline use of the original Magne-Probe has spread since its first introduction four years ago. At Pan American World Airways, where it has been adopted as a standard shop tool, service life of Pratt & Whitney R-4360 engine collector rings has reportedly been extended by more than 20%.

United Air Lines, another user of the device, applies the Magne-Probe when the combination of service time, thickness and appearance of exhaust parts indicate it advisable. A normalizing heat treatment is then used when a magnetic indication is detected.

Attachment for Machine Bending of Sheet Metal

A simple bending brake attachment that makes the complex bending of sheet metal parts a machine operation instead of a hand-and-mallet job has been introduced in Pan American World Airways' Pacific-Alaska Division base at San Francisco. The idea brought its designer, mechanic Wallace Norden, a cash award from the PAA suggestion committee.

The Norden approach to the brake adaption was to replace the long metal bar which runs the length of the brake with a short sectional bar when making bends in more than one direction. This permits the operator to make the first bend, then reverse the sheet metal in the brake and bend it in the opposite direction (see photo).

The sectional bars used by PAA were turned out in the shop in lengths ranging from one-half inch to a foot. They have worked equally well where step bends are called for in parts fabrication.

BENDING BRAKE attachment.

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People

MANUFACTURING

David A. Thomas, previously president of Cleveland Tapping Machine Co. has been named chairman of the board of directors and executive director of the Babb Company.

James W. Rice has been appointed administrative assistant to Wellwood E. Beall, senior vice president of Boeing Airplane Co. Rice, formerly the company's budget control supervisor, succeeds **F. A. Housey** who requested an indefinite leave of absence.

C. W. Greaves has been named special assistant to the manager of Convair's San Diego Division. Prior to this latest post, Greaves was the division's public relations representative.

William C. Hean has been appointed general manager of the Permetex Co.'s new Kansas City, Kansas, plant.

William L. Smith, formerly assistant director of the Industry Planning Service of the Aircraft Industries Association, has been appointed general manager of the Fairchild Speed Control Division of Wickliffe, Ohio.

Stanley J. Smith has been named to head the recently formed Control Laboratories, Inc., an associate company of Avien. **R. J. Levine,** formerly director of engineering for Avien, has been appointed vice president and elected to the board of directors of the new concern.

Robert J. Wright has been appointed manager of foreign operations for AiResearch Manufacturing Co., and has moved from his post in Washington to Los Angeles, the firm's main office.

Bruce H. Atwater, former vice president for sales of Pacific Airmotive Corp. is in charge of Clary Multiplier Corp.'s expanding aircraft division.

William S. Richardson has been elected president of the B. F. Goodrich Co. succeeding **John L. Collyer** who was re-elected chairman of the board and chief executive officer. Richardson has served as Goodrich's executive vice president since 1952.

Richardson

Renda

AIRLINES

D. P. Renda has been elected vice president-legal to head a newly formed division of Western Air Lines covering legal proceedings, CAB cases, property

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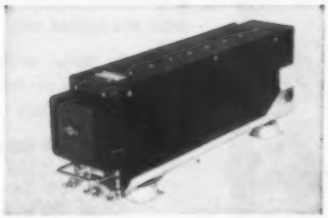
17M-1 VHF TRANSMITTER — 350 remotely controlled channels. Minimum of 40 watt signal on any VHF channel — excellent stability. Special attention given to elimination of spurious emissions. The 17M-1 is the only transmitter of its type that complies with ARINC 520 specifications.

51X AIRBORNE VHF RECEIVER — Companion to the 17M-1 transmitter. 360 channels. Provides complete VHF coverage. Designed especially to meet ARINC 520-A requirement. Special attention has been given in engineering and manufacturing to the elimination of spurious responses.



51R-3 NAVIGATION RECEIVER — Fulfills navigation and communication receiving requirements of all types of commercial aircraft using the 108 to 136 mc band. Provides for omni, VHF communications and ILS. The Collins 51R-3 is the standard VHF receiver for the aviation industry.

AMERICA'S PREMIER AVIATION SHOW....

Again this year Dayton will provide the setting for the National Aircraft Show — America's Premier Aviation Show.

Scene of this outstanding event will be the sprawling J. M. Cox Dayton Municipal Airport at Vandalia. It will feature aerial exhibitions by the U. S. Armed Services and ground exhibits by the industry . . . including the staging of such traditional high-speed classics as the Thompson, Bendix, Allison, General Electric and like trophy events.

Spacious hangars will provide the vast indoor exhibit space for engines, instruments, accessories, equipment, parts, etc. The adjacent concrete aprons will be transformed into the country's largest outdoor showroom for personal, commercial and military aircraft.

This show has been accorded national acceptance by the aircraft industry. By tradition it is the nation's major aviation event and the common meeting place for its air-minded public and all components of private, commercial and military aviation.

Last year it witnessed one of the most thrilling and inspiring aerial presentations of our U. S. air might . . . and received the overwhelming support of major industrial exhibitors from coast to coast who utilized over 20,000 sq. ft. of indoor exhibit space.

The only major show approved for participation by the U. S. Department of Defense and the Armed Services. It merits your serious consideration.

For floor plan diagrams, exhibit space contracts, ticket information and complete details write—Benjamin T. Franklin, General Manager, **NATIONAL AIRCRAFT SHOW, 400 Union Commerce Bldg., Cleveland 14, Ohio.**

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AIR FOUNDATION and DAYTON CHAMBER of COMMERCE
SANCTIONED BY NATIONAL AERONAUTIC ASSOCIATION

contracts, lease negotiations, and route development and research.

William Thomas Beebe has been named vice president of personnel of Delta-C&S Air Lines.

Otis E. Kline was recently elected vice president-coordinator of operations for United Air Lines. Kline will be in charge of overall coordination of the activities of engineering and maintenance, transportation services, and flight operations.

Walter H. Johnson, Jr., has been appointed vice president and sales manager of American Airlines, reporting to **C. R. Spears,** AA's senior vice president of sales.

Paul Stouffs is SABENA Belgian Airlines' new vice president of sales, succeeding the late **Leon Schoevaerts.**

C. M. Britt, formerly district sales manager for Capital Airlines in Washington, has been elected vice president of sales for Southern Airways. Britt succeeds **Norman K. Arnold** who is now Southern's vice president of research. **O. E. Willmann** has taken over as CAP's d.s.m. in Washington.

Dirk J. Koeleman has been named general manager of KLM Royal Dutch Airlines' organization in the United States, succeeding **C. F. C. Meuser.** Koeleman, who will make his headquarters at KLM's executive offices in New York, was previously the firm's general manager in France.

Randall T. Holden, formerly assistant district sales manager of Philippine Air Lines, has been named manager of cargo sales for Japan Air Lines.

W. J. Buehren is the Flying Tiger Line's new superintendent of maintenance, replacing **A. Goldberg,** resigned.

Charles M. Mathews has advanced from assistant to purchasing agent of Braniff Airways.

W. C. Leatherwood has been named director of purchasing for Trans-Texas Airways. Prior to his new post, Leatherwood was the firm's director of plant maintenance and transportation.

- **E. P. Clites,** United Air Lines. Lead line mechanic, Los Angeles. 25 years.
- **A. W. Dwyer,** United Air Lines. Chief flight dispatcher, Denver. 25 years.
- **W. W. Glover,** United Air Lines. Aircraft inspector, San Francisco. 25 years.
- **U. S. Hibbert,** United Air Lines. Flight training center, Denver. 25 years.
- **T. Lee, Jr.,** United Air Lines. Director-education and training, Cheyenne. 25 years.
- **M. J. Drabik,** United Air Lines. Lead line mechanic, Chicago. 25 years.
- **E. H. Paul,** United Air Lines. Lead shop mechanic, San Francisco. 25 years.

QUESTIONS AND ANSWERS ABOUT GILFILLAN

QUESTION: The name Gilfillan has become synonymous with GCA radar. Is GCA radar Gilfillan's main activity?

ANSWER: No. Gilfillan activities are highly diversified. The company is engaged in: aircraft components manufacture (since 1917); surveillance radar (1942); airborne radar (1944); radar trainers (1945); radar training schools (1946); automatic GCA radar (1947); automatic air traffic control radar (1949); radar countermeasures (1951); ground and air systems for guided missiles (1952); and additional classified projects in related fields since 1953.

QUESTION: Are Gilfillan contracts diversified?

ANSWER: Yes. Gilfillan is now fulfilling development and production contracts for the U. S. Air Force (Air Defense Command, Air Materiel Command, Strategic Air Command, Tactical Air Command); Army Ordnance; Army Signal Corps; U. S. Navy (Bureau of Aeronautics and Bureau of Ships); Royal Canadian Air Force; Royal Australian Air Force; South African Air Force; and for the governments of France and other NATO countries.

QUESTION: Is Gilfillan a World War II company?

ANSWER: No. Gilfillan has engaged in precision research, design and production of aircraft components and electronics equipment since 1912.

QUESTION: Is Gilfillan a small company?

ANSWER: No. Gilfillan has 7 plants, dispersed throughout Southern California.

QUESTION: Has Gilfillan a special reputation for efficiency and versatility?

ANSWER: Yes. Gilfillan has solved difficult electronics design and production problems in a wide range, from the smallest, lightest airborne radar and radar trainers to guidance systems for the largest and most complex guided missiles. Gilfillan has again and again succeeded in effecting great economies in size, weight and number of components, with an increase in efficiency and reduction in cost.

QUESTION: Are Gilfillan deliveries on schedule?

ANSWER: Yes. Gilfillan has an international reputation for dependable, on-schedule deliveries.

QUESTION: Can Gilfillan take on new projects at the present time?

ANSWER: Yes. Current and continuing Gilfillan expansion in equipment and production facilities permits Gilfillan to engage in new problems in related fields.

GILFILLAN, LOS ANGELES--GCA Radar and Electronics

AIRLINE COMMENTARY

• TRAFFIC • SALES • PUBLIC RELATIONS • *by Eric Bramley*

Airlines are watching closely for CAB reaction to three requests for passenger fare increases. Continental, Pioneer and North Central have asked boosts amounting to about 4.5%. There's more and more talk in industry about need for fare adjustments, with expenses still rising and traffic growth slowing down. Airlines are meeting with CAB on May 18 for important talks on the entire economic situation, including fares. But action on three requests already in may come before then.

•

Biggest traffic nosedive in a long time has been taken by air express. Revenues in first three months of 1954 were about 22% under same 1953 period. Reasons seems to be (1) business didn't bounce back after REA strikes last fall, (2) first quarter of '53 was unusually good, (3) diversion to air freight (which, incidentally, is showing a nice gain). It's a serious revenue cut for carriers.

•

Who's the youngest airline president? North Central files a claim for Hal Carr, who is 33. He noses out Mohawk's Bob Peach (34). Anyone beat 33?

•

TWA's Washington office recently received a phone query: "How do you keep your pilots lit?" Explanation: wrong number. TWA's number is almost the same as the gas company's.

•

Best example we've heard of the importance of public relations at airports was given at the Airport Operators Council meeting in Tampa by Woody de Silva, manager of Los Angeles International Airport. Last year an airport bond issue was defeated in Los Angeles, and the airport management wanted to know why. It hired an independent outfit to make a survey. Answer was that people didn't want their taxes raised. However, it was discovered that families whose kids had been on conducted tours of the airport (arranged through their schools) voted 92% in favor of the bond issue. That's why Woody is glad to show anyone around the field. Such favorable influence on families can be vital in connection with the airport noise problem.

No-Show Penalty System?

C. R. Smith, president of American Airlines, has come out strongly for abolition of the reconfirmation rule and for establishment of a 10% penalty for customers who neither use nor cancel space. "If a customer buys a perishable product he should not be entitled to the return of all his money on the whimsical basis that he did not want it when it was delivered and did not tell the vendor of his change of mind, so that it could be sold to someone else," Smith said. Reconfirmation has been "complicated and uneconomical" and represents "negative salesmanship" because it requires the customer to say twice that he wants to buy the product, he added.

Smith's position is sure to stir up the industry, which hasn't been together on a penalty system for first-class flights (it's now being tried by coach operators). Opponents' principal claim seems to be that penalties won't work until there's an iron-clad system for selling all tickets in advance.

Tax on Tickets

U. S. Internal Revenue Service has finally ruled that U. S. transportation tax can't be avoided by buying tickets in Canada or Mexico for travel between two U. S. points. It applies whether a passenger buys a "through" ticket (such as Windsor, Ont., to Miami) or separate tickets—one for Windsor—Detroit rail travel and another by any form of transport, Detroit-Miami. It's a situation that Internal Revenue should have straightened out long ago.

Passenger Service

On Pan American World Airways flights, passengers can now cleanse themselves without leaving their seats. PAA is using **"Wash-'n-Dri,"** an 8½ by 6-inch disposable wash cloth which contains a mild cleanser. Tear open the small airtight package, use cloth on face and hands, and throw it away. The cleanser air-dries quickly. Saves on water, soap and towels aboard the plane, and it's very easy (and satisfactory) to use. Made by **R. R. Williams Inc.,** 54 W. 21st St., New York.

Traffic and Sales

United Air Lines starts eastbound DC-7 San Francisco-New York 7½-hour nonstop service on June 1. The 9½-hour westbound trip includes a Denver stop. When UAL starts Los Angeles-New York DC-7's, probably in July, flights will be nonstop both ways . . . UAL has inaugurated **"Executive' (men only)** round-trip Los Angeles-San Francisco (no extra fare). On New York-Chicago Executive, UAL is now serving a free drink before dinner. Practice started after institution of $3 extra fare . . .

Eastern Air Lines has extended its advertising program to 88 cities on its system. Company had regular ads in 30 larger communities, but last month started a new campaign covering 58 others. It's running 100-line ads four times weekly, aimed at getting people to **use plane and rental car** rather than their own autos . . . On the same day **Northwest's first spring national magazine ad** appeared (on the Orient) simultaneous tie-in displays featuring the ad were unveiled in 250 travel agent, ticket office, and department store windows in U. S. and Canada . . . EAL is mailing 75,000 direct mail pieces urging corporations to use **EAL package vacations** as prizes in sales contests . . . **Capital** has stepped up its excellent **direct mail campaign** aimed at convention business . . .

Following a trial period (mentioned here April 12) **Frontier has switched from regular coffee** to individual service packs of Maxwell House instant coffee on all flights . . . United has installed **automatic telephone answering equipment** at four intermediate stations (Medford, Salem, Milwaukee, and South Bend) for use when stations are closed at night or when personnel are busy on the ramp. Recorded voice invites caller to **record name and telephone number** for a follow-up call from UAL. A 30-second interval is provided for recording caller's massage . . .

Delta-C&S has published, as part of its training program, a 42-page magazine, **"A Review of the DC-7,"** designed to acquaint employes with the plane and help them answer the public's questions. It's A-1 throughout, covering performance, sales and technical features, ground operations, etc. Congratulations to **A. C. Ford,** Delta-C&S publications and training superintendent . . . **Pan American** is distributing a 12-page booklet, **"How to Clear U. S. Customs the Easiest Way."**

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Carriers Split on Mail Pay Policy

Twelve domestic airlines and the Post Office Department have given the CAB varying opinions on what the future level of air mail pay should be, what type of rate structure is preferred, and whether or not there should be mileage equalization.

The CAB requested statements from the carriers after it reopened all domestic rates—an action which followed the Post Office's announcement that it intends to use the lowest-rate airline for mail on competitive routes, and to use the carrier with the shortest mileage between points.

Some of the airlines favor rates higher than the former 45¢ per ton-mile service pay, while others are satisfied with that figure. There was also difference of opinion on a "multi-element" rate structure, which would contain two pay figures—one for line-haul, the other for terminal handling of mail.

A summary of the answers to the CAB follows:

• **Post Office**—prefers a "simple rate structure" and believes the rate level "should not exceed fair cost plus a reasonable return for investment," thus eliminating any consideration of "value of service." The carriers insist strongly that value of service, in addition to cost, must be included in rates.

• **TWA**—Mail rate should be not less than first-class passenger yield of 60¢ per mail ton-mile, adjusted upward if there is mileage equalization (which TWA believes can be accomplished).

• **United**—will accept the former 45¢ ton-mile rate in order to avoid a long and costly hearing, an extended "open rate" period, and to avoid necessity of trying to reach agreement on a complex multi-element rate formula. UAL feels that rather than concentrating only on mail pay "further consideration should be given to a proper revision . . . of the prices for all services." Opposes mileage equalization.

• **American**—Believes rate should be 45¢, but favors a different rate method. Long-haul mail would be less than 45¢, short-haul higher. There might be a "minimum charge for extremely light shipments as well as a specific terminal or handling charge."

• **Eastern**—On a multi-element basis, rate should be $85.59 per ton of mail and 42.19¢ per mail ton-mile, adjusted upward if there is mileage equalization. EAL's 1953 cost per mail ton-mile, with allowance for 85¢ operating ratio, was 58.22¢.

• **National**—Wants 45¢ rate domestically, but higher to Havana. Favors multi-element structure.

• **Northwest**—Domestic rate of 57¢ per ton-mile, same as its average yield for passenger traffic. Opposes multi-element rate and mileage equalization.

• **Capital**—Favors multi-element rate. In 1953, company's fair and reasonable average rate under multi-element structure would have been 52.79¢ a ton-mile, and should be higher in 1954. Figure would be adjusted for mileage equalization, which Capital favors.

• **Western**—Under multi-element structure, line-haul charge of 35.13¢ per ton-mile. Station handling charges should be $169.42 per ton enplaned or deplaned at stations with 0-399 tons enplaned or deplaned annually (all traffic), $86.38 for 400-1999 ton stations, $59.16 for 2000-19,000, and $42.18 for 20,000 and over. Figures must be adjusted for equalized mileage.

• **Braniff**—Asks 34.94¢ ton-mile line-haul plus terminal charges (same station classification as WAL) of 8.3¢ per lb., 3.225¢, 2.750¢ and 2.450¢, respectively.

• **Delta-C&S**—Rate of 64.3¢ per ton-mile (54.65¢ actual cost plus 9.65¢ profit margin, based on 85% operating ratio).

• **Continental**—Same rate as other carriers on competitive routes; present compensatory figure, or a higher one, between non-competitive points.

• **Northeast**—Interim solution may be a simplified dual-element formula based on ton-mile line-haul rate plus fixed charge per mail pouch transported. Favors equalized mileage with appropriate rate adjustments. • • •

Feeders May Get Permanent Certificates

Permanent certification of the local service or "feeder" airlines would be required of CAB under legislation recently introduced by Rep. Carl Hinshaw (R., Calif.), if Congress enacts the measure into law.

The bill Hinshaw presented, H.R. 8898, proposes amendment of Section 401(e)—the original "grandfather rights" clause—of the 1938 Civil Aeronautics Act. Specifically, it is proposed that upon application of an air carrier within 120 days after the law takes effect, at which time domestic feeder service is then being performed under a temporary certificate by the applicant, the Board shall award a certificate of unlimited duration (unless it is found that service has been inadequate or inefficient).

A similar proposal is also being pushed in the Senate Commerce Committee.

CAB NEWS

AS OF NOW . . .

Latest move in the **Colonial Merger Case** is National Airlines' effort to have Eastern Air Lines "quarantined" insofar as transactions in integration of Colonial and EAL are concerned, because the airline still "illegally controls" Colonial.

CAB Examiner Barron Fredericks has recommended that in the so-called **Fayetteville Case** Central Airlines be granted 786 additional route-miles including extensions from Muskogee, Okla., to Little Rock, Ark., via Fayetteville, Ark., Ft. Smith, Ark., and Hot Springs, Ark.; from Muskogee to Ft. Smith; from Muskogee to Joplin, Mo.; and from Paris, Tex., to Kansas City via Ft. Smith, Fayetteville, and Joplin.

RECENT CAB DECISIONS

• **TWA's** complaint alleging that Seaboard and Western Airlines offered shippers frequent and regular flights between Frankfurt and New York, etc. was dismissed by CAB's Office of Compliance.

• **Capital Airlines** was authorized to provide nonstop Cleveland-New York service on a certificated basis. Capital had operated nonstop under exemption since June, 1952.

• **North American Airlines'** application for an exemption to operate Washington-New York air coach shuttle service at $10 (one way, including tax) was denied.

• **Allegheny Airlines** was authorized to transfer operations at Clearfield-Du Bois-Philipsburg, Pa., from Albert Field to Philipsburg Airport.

CAB CALENDAR

May 17—Hearing in Frankfurt-Zurich Service Case (TWA, Pan American). Tentative. Place and hour to be announced. Docket 5737.

May 17—Hearing in Consolidated Mail Rate Case (Hawaiian Airlines and Trans-Pacific Airlines). Tentative. Place and hour to be announced. Docket 6305 et al.

May 18—Hearing in Denver Service Case (TWA, et al.). Denver, Colo. Docket 1841 et al.

May 21—Hearing in Ely, Nev., Service Case. Denver, Colo. Docket 6528.

May 26—Oral Argument before the Board in Trans-Pacific Certificate Renewal Case. (Northwest, Pan American et al.). Washington, D. C. Docket 5031 et al.

May 28—Oral argument before the Board in West Coast Hawaii Case. Washington, D. C. Docket 5589 et al.

June 1—Hearing resumed in Denver Service Case (see above).

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INTERNATIONAL AVIATION

Edited by Anthony Vandyk

INTERCOM

These are difficult times for de Havilland and purchasers of the Comet. Any decision taken can be criticized and lack of decision can equally evoke criticism. Nevertheless, few can disagree with the suspension of Comet II production until more has been discovered on what caused the Comet I accidents. Actually none of the eight airline purchasers of the Comet II will be too seriously affected by delays in delivery, except BOAC, which, with 12 on order, has the heaviest stake in the success of the type.

Panair do Brasil may be slightly embarrassed about the situation, as it has been counting on the Comet II to regain business lost since its L-49 Constellations met competition from DC-6B's and Super Connies on the Europe-South America run. Although the Brazilian flag carrier is reported to be studying the purchase of Super Connies as alternate equipment, these could not be available for some long time.

Air France, with six Comet III's on order, will be able to maintain a competitive position equipment-wise with its 10 Super Connies and 21 L-749 Connies, while UAT-Aeromaritime, the other French Comet purchaser, recently acquired DC-6C equipment. Canadian Pacific Airlines, by now accustomed to setbacks in launching Comet operations, has a fleet of DC-6B's capable of taking care of all present international route commitments pending availability of its three Comet III's.

Linea Aeropostal Venezolana and Qantas Empire Airways (which has taken over the BCPA Comet order) have purchased Super Connies in addition to three Comet II's each. Japan Air Lines, the eighth airline with Comet II's on order, has a sufficiently large DC-6B fleet (in service and on order) to open its projected service to Europe without having to wait for the two jetliners on order. Thus, it can be seen that delays in Comet II deliveries in most cases will have no serious effects on prospective jetliner operators.

Latin American Military Orders Rise

Substantial supplies of U. S. military aircraft—some modern and others obsolescent or obsolete—are soon to be supplied to certain Latin American countries. This indicates that the U. S. government and industry have realized that the U. S. role as No. 1 aircraft supplier to Latin America is being threatened, at least in the military field, by European nations (notably Britain).

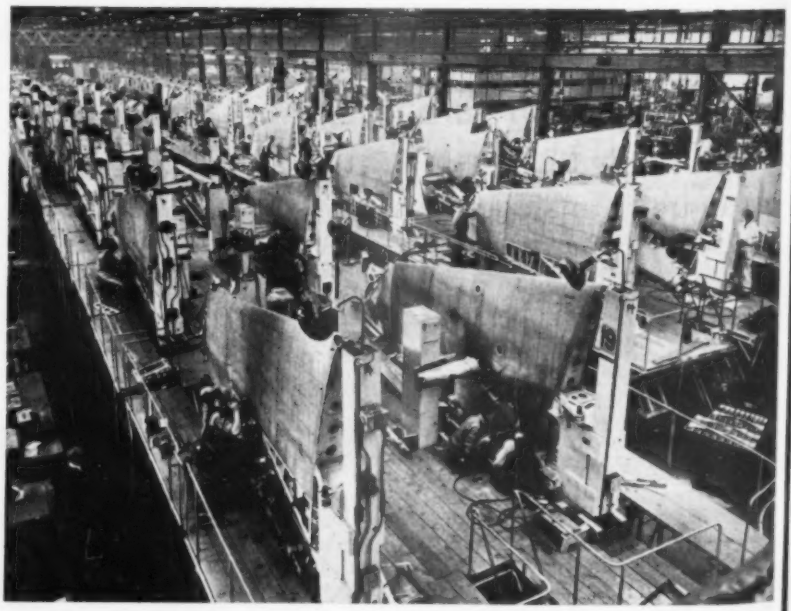
First indication of this realization came in January, when a group of USAF jet aircraft made a goodwill tour of the Latin American countries to counter, it seemed, the effects of a similar visit in 1953 by a unit of RAF Canberras.

Aircraft deals have been negotiated recently between the USAF and Brazil, Cuba, and Colombia, and similar transactions to enable the air forces of Mexico, the Dominican Republic, and Peru to obtain modern U. S. planes are pending.

The biggest project involves supplying Brazil with 50 North American T-6 trainers for $188,000, seven Boeing B-17's for $924,000, and possibly a few C-82's. The Brazilians have already agreed to the T-6 part of the program, and deliveries are under way, with about five to ten planes being flown south each week by Brazilian Air Force pilots.

Agreement has been reached between the USAF and Cuba for the delivery of two Lockheed T-33's by June 7 and two more by September 15. These trainers will come from current production. Fly-away cost for each aircraft will be $122,000, plus $61,000 for a year's supply of spares. Colombia bought six T-33's under a similar deal announced at the beginning of March.

Ecuador is considering the purchase of 12 jet fighters (reportedly North American F-86F's) under a $5 million package deal which would include spares and the training of pilots. This project is still in the preliminary discussion stage.



Hawker Hunter is now in quantity production in England. To facilitate manufacture the fighter is broken down into a number of main assembly units, each absolutely complete in itself, containing all ancillary equipment, just as it will be on the finished aircraft. This photo shows wing production.

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MANUFACTURING

NETHERLANDS: Fokker Aircraft Co. has taken over the aviation division of the De Schelde shipbuilding company, which is quitting the aviation field after 20 years' activity. The Dordrecht aircraft plant will probably be used by Fokker in connection with the Hawker Hunter license program.

GERMANY: Siebel-ATG is interested in the Morane Saulnier MS 733, French piston-engine trainer, for possible license production; Messerschmitt in the jet-powered MS 755 Fleuret trainer; and Dornier in the Fouga 170R Magister in Germany.

BRITAIN: Two Napier Nomad compound engines are to be flight-tested in the outer positions on an Avro Shackleton patrol bomber.

A Handley Page Marathon with two Alvis Leonides Major engines is scheduled to be displayed at this year's Farnborough show.

Production Vickers Swift fighters feature several differences from the prototype—single instead of double airflow fences; spoiler strip near wing root; neater second, internal boundary layer bleed; retractable steps in starboard intake fairing.

FRANCE: A Dassault Ouragan with a new type of landing gear for operating from fields without runways has been tested. A tail parachute is fitted to this version of the jet fighter.

AIRLINES

BRITAIN: BOAC has temporarily suspended its services to South America due to equipment shortage. The Argonauts that operated the South American flights have been switched to African and Asian routes.

British European Airways is operating its Viscounts at 57,000 lbs. gross, an increase of 1000 lbs. in a year. It hopes to boost the Ambassador's gross from 52,500 to 55,000 lbs. soon.

ICELAND: Loftleidir will increase its "cut-price" trans-Atlantic service to three round trips weekly effective May 27. Direct service will be provided to New York (via Reykjavik) from Gothenburg as well as from Hamburg, Copenhagen, and Stavanger with DC-4 equipment. Carrier's one-way fare to Copenhagen is $273.65 against the IATA tourist fare of $328.10.

MEXICO: Aeronaves de Mexico has taken delivery of its four Convair 340's.

BRAZIL: Aerovias Brasil expects to take delivery of its first French-built Nord 2501 Noratlas in June and should have four more in operation by the end of September.

MILITARY

BELGIUM: Bristol 171 helicopters have been ordered by the Belgian Air Force for ambulance and rescue work in the Congo.

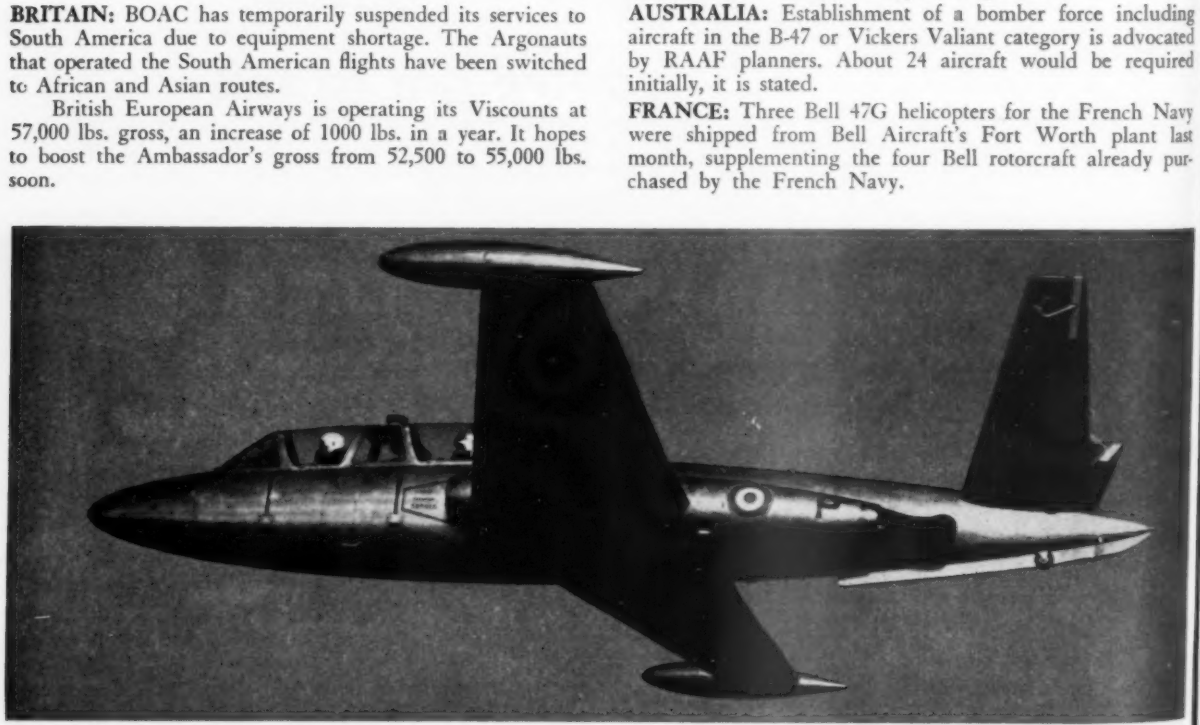
GREECE: The NATO program calls for the Greek Air Force to be re-equipped with F-86 Sabrejets, it is unofficially reported.

BRITAIN: There were 91 fatal accidents involving RAF jet aircraft in 1953 in the U.K., causing loss of life for 112 RAF members. These figures are lower than those for 1952, although the number of hours flown in 1953 was about one-third greater.

SOUTH AFRICA: South African Air Force recently sold about 30 C-47 transports to Field Aircraft Services, London. SAAF has now retired its Spitfire fighters.

AUSTRALIA: Establishment of a bomber force including aircraft in the B-47 or Vickers Valiant category is advocated by RAAF planners. About 24 aircraft would be required initially, it is stated.

FRANCE: Three Bell 47G helicopters for the French Navy were shipped from Bell Aircraft's Fort Worth plant last month, supplementing the four Bell rotorcraft already purchased by the French Navy.



Flying time with Fouga 170R Magister jet trainer is over 300 hours. Three prototypes have been built by Fouga & Cie. (Aire-sur-Adour, Landes, France). First pre-production aircraft is due to fly this month; first of 95 production Magisters for French Air Force should fly before the end of the year.

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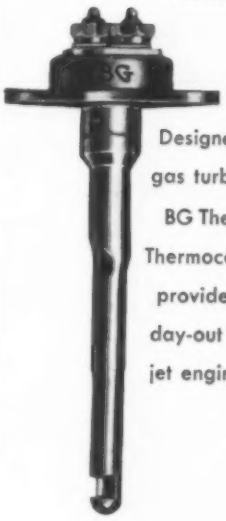

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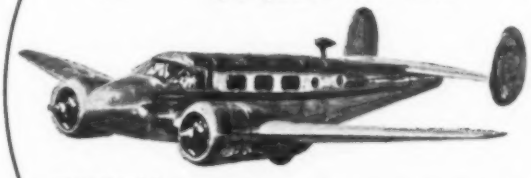

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WAYNE W. PARRISH

Pilgrimage to Spain. Few parts of the world are as fascinating as the Iberian Peninsula occupied by Spain and Portugal. Since prehistoric times there has been a progression of races and cultures imposed on this peninsula and each has left its marks. The Celts, the Vandals, the Visigoths, the Romans, the Moors, the French, and then the Christian reconquest which blossomed into Spain's greatest days of world expansion and colonial power in the sixteenth century, all have left Spain with a rich storehouse of treasures and history.

Of all the countries of Europe, Spain has remained most isolated and most individualistic. In recent years it has become a tourist paradise, and Madrid is one of the most cosmopolitan and modern of world capitals. But a large part of Spain has remained in the past, cut off from much of the modern trend and modern whirl.

In early 1931, several months before the revolution which threw out the monarchy, I spent five weeks traveling by third class railroad over much of Spain and Portugal. Out of the full year I spent in Europe on a scholarship, the visit to Spain was by all odds the most interesting. Its cathedrals, its art treasures, and its friendly, simple people left an indelible impression on me. In the intervening 23 years I have been back to Madrid three or four times, but a pilgrimage to the real Spain was always put off for lack of time.

New Invasion. But this spring I could wait no longer. A new invasion is about to begin and it might well make more changes in Spain than the 700 years of Moorish occupation. The U. S. is about to build three big air bases and the Navy is building a naval base or two. Big money will be pouring in. More and more tourists are flooding the main cities of Spain, too, adding to the change in economy and outlook.

I figured it was now or never. So on April 3 my wife and I headed overseas for a motor trip through Spain and part of Portugal to revisit those places which fascinated me in 1931 and to see places which were beyond my reach over 20 years ago. I wish I had made the trip last year, not this, since the Palace Hotel in Madrid right now has more Americans than the Statler in Washington.

President Special. This time we chose Pan American's once-weekly President Special nonstop from New York to Paris. Having tried out Air France's de luxe Golden Parisian and having enjoyed the first class services of SAS's Royal Viking, TWA, Swissair, and BOAC, I wanted to see what this de luxe PAA Stratocruiser service was like.

I found out. There isn't anything better. For this once-weekly Special, PAA charges $25 extra fare per person. Berths are $35 each. But there are two staterooms available in the forward compartment, providing privacy, for $125 each. My wife and I were given the use of one of the staterooms for takeoff and through the dinner hour, but other passengers had taken the compartment for sleeping and we had upper berths in the rear.

As I've written before, the airplane cannot compete with a steamship for truly de luxe travel, simply because of the physical limitations of the vehicle. But it is amazing how much can be done to provide first class comfort on blue ribbon flights, providing there are enough passengers willing to pay the necessary increased fares.

PAA added the two staterooms with some misgivings, I'm told, but the misgivings were soon forgotten by the advance bookings. There are people, enough people, who will fork over the dough to get superior accommodations. On the Special the seats are sleeperettes providing almost full reclining, hence the load factor is limited to something over 40. But every seat was filled by the extra-fare patrons and a surprisingly high number took berths.

Staterooms. For the stateroom atmosphere, PAA merely took the two regular forward compartments which are located ahead of the washrooms, and redesigned them for comfort. If you want privacy, just pull the curtain along the aisle. In each stateroom is a cabinet about 18 inches wide and three feet long, very much like a railroad cabinet, containing water pitcher and glasses, folding sink, and more lotions, cosmetics, shaving equipment, soaps and the like than I've ever seen anywhere before. For drinks the steward brings your liquor in carafes, with ice and soda, so you do your own mixing.

For the Special, PAA has no less than five crew members for the passengers—a purser, steward, and three stewardesses. Dinner is served by courses and it is quite a layout, I can assure you. First come the hors d'oeuvres, served from an iron-wrought tray which moves up the aisle. This in itself is quite an innovation. The tray is light in weight and has wheels on two of the four legs. It's big enough to provide a wide assortment.

Next comes soup, and then, lo and behold, you are asked what you would like for the main course. You have choice of steak or pheasant, precooked and frozen. All of this is served on your table, not on a tray. The chinaware and silverware are of high quality and you might as well be eating in the Waldorf. After the main course comes a hefty dessert, cheese, liqueurs, and all the rest. Oh yes, I almost forgot the champagne.

Choice of Breakfast. After a good sleep (I was again impressed by how quiet the Boeing Stratocruiser is by comparison with other airplanes) you get up and are offered fruit juice right away. Then you get a choice (that choice business impressed me no end) of French toast or ham and eggs. And in no time at all you're over France and getting ready to land at Orly Airport in Paris. On our trip we were two hours ahead of scheduled time, thanks to some kindly winds, and the trip was about as painless as any I've ever made.

The PAA people were all top-notch and helpful, starting with **Nelson Danziger** of passenger service at Idlewild and on to **Ben Holt**, the new PAA public relations rep in Paris, who had a bottle of champagne and flowers in our room at the Reynolds Hotel when we arrived there. **Captain John C. O'Connor** made the rounds of the cabin talking to everybody on board. His easy, friendly manner made a big hit. But a special orchid should go to **Jerry Cameron**, the purser, who directed his cabin crew in white jacket and with all the experienced finesse of a maitre d' at a top hotel.

PAA's passenger service, if this was a sample, has improved vastly, and somebody is doing some tall thinking and using imagination about all of the little gimmicks which add to a trip such as perfume and orchids for all of the women passengers.

Transition. This was my 20th eastbound trans-Atlantic air flight and I guess I'll never cease to be thrilled by the overnight transition from one continent to the other. You get on the airplane in the New York you know so well. Next stop is another world, although I must say that Paris is more familiar to me by now than some American cities. Paris customs and immigration continue to be exceptionally good and fast, especially for Americans, and as usual there was the smiling face of AMERICAN AVIATION's Paris representative, **Jean-Marie Riche**, to welcome us as we got our baggage cleared.

That night Jean-Marie and his wife **Yvette**, and my friend **Pierre Groc** of SAS and his wife **Janine**, had dinner with my wife and me at La Perigourdine on Place Saint Michel on the left bank. It is one of Paris' better restaurants and my onion soup and duck with mushroom sauce were of superior quality. So was the rose-wine. And there was Paris in all of its beauty, and life was good, and before us lay a motor trip down through France and across the border to Spain.

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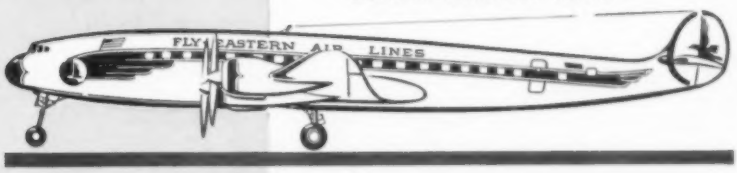

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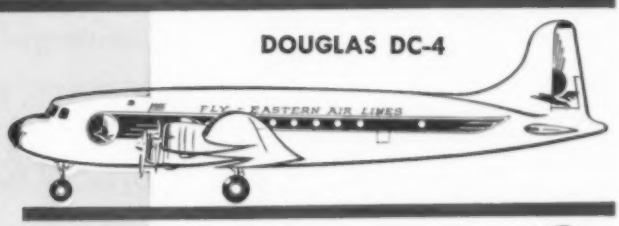

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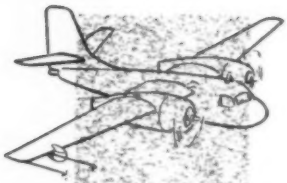

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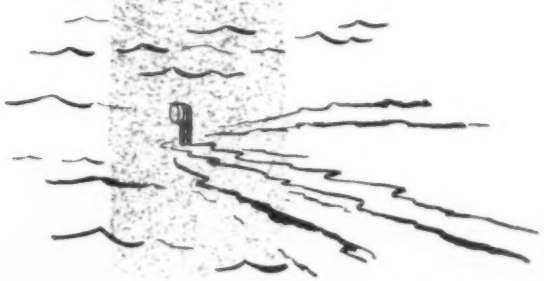

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News at Deadline

Stockholders Approve G-D, Convair Merger

Stockholders of General Dynamics Corp. and Consolidated-Vultee Aircraft Corp. have approved the merger of the two firms in meetings held concurrently in Dover, Del. Directors had previously approved the merger. The move took effect April 30, when the merged board of directors held its first meeting.

Stockholders of Convair will receive 4/7th of a share of G-D stock for each Convair share. John Jay Hopkins becomes board chairman and president of the merged corporation.

Fairchild New Entrant In Trainer Contest

The Navy competition for a new trainer, which has already generated considerable controversy (see story, page 16) has a new participant: Fairchild Engine & Airplane Corp. Three designs and cost estimates have been submitted to the Navy by Fairchild.

The move followed reopening of Navy negotiations with Beech Aircraft Corp. and Temco Aircraft Corp.

Boeing 707 Transport Will Fly in June

Boeing's jet transport, the 707, is due to fly in June, two months ahead of schedule, according to William M. Allen, president of the firm.

First quarter net has been reported by Allen as $8.4 million, on sales of $266 million. First quarter net for 1953 had been only $3.5 million on sales of $196 million.

Stockholders voted at the annual meeting to split present shares two for one. There are currently 1.6 million shares outstanding, out of an authorized total of 2.5 million.

Los Angeles Airways Orders Another S-55

An additional Sikorsky S-55 has been ordered by Los Angeles Airways, with delivery scheduled for August. LAA will have a fleet of seven helicopters at that time: four S-55's and three S-51's.

The purchase was prompted by the fact that LAA's present fleet is becoming inadequate for growing traffic and by the fact that the carrier plans to start passenger operations this fall.

North American Nets $9 Million in 6 Months

Net profit for North American during the six months ended March 31 has been reported as $8.85 million on sales of $298 million. For the first half of 1953 the firm had netted $5 million. Backlog on March 31, 1954: $1.11 billion, up from $1.03 billion three months earlier.

CAA Viscount Team To Leave for Britain

Discussions on certification of the Vickers Viscount turboprop transport will be carried on by a group from CAA which is scheduled to leave for Britain on May 15. Preliminary talks will be carried on with the British Air Registration Board by the four-man team, which will be headed by the chief of the Aircraft Engineering Division, W. H. Weeks.

Other members of the group will include S. H. Rolle, power plant specialist; R. B. Maloy, flight test; and A. A. Vollmecke, airframes.

The forthcoming trip follows a request for assurance of U.S. certification of the Viscount from Trans Caribbean Airways. Orders for the Viscount were recently brought to 93, with the Canadian Department of Transport and British West Indian Airways each ordering one (BWIA already had three others on order).

Three More Connies For Air France

Three more Lockheed Super Constellations have been ordered by Air France. They will be L-1049G's with a take-off gross weight of 137,500 pounds, as compared with the L-1049C's weight of 133,000 pounds. Two will replace the airline's Comet IA's, and the third will help to make up for late deliveries of the Comet II, which now seem inevitable. Air France's Connie fleet will thus be brought to a total of 13. This figure would probably rise to 16 if the carrier should cancel its order for six Comet II's.

New Douglas V.P.'s

Two new vice presidents have been elected at Douglas: A. M. Rochlen, director of public relations, and K. G. Farrar, general manager of the Long Beach Division. Rochlen joined the company in 1937, Farrar in 1934.

Two New Decca Navigation Systems

Two new navigation aids for long range flying are being developed by the Decca Navigator Co. of London. One, "Dectra," is for use on portions of a specific route. The other, "Delrac," would give wider coverage, with the possibility that 12 pairs of ground stations could cover the world.

"Dectra" consists of one high-powered master station giving continuous wave transmissions on a selected frequency at each end of the route, combined with transmissions from nearby "slave" stations. Ranges are possible up to 2000 miles. Weight will be approximately 130 pounds. Position is indicated by a pen which traces the aircraft's path on a chart.

"Delrac" is a very low frequency system working on transmissions from three or four frequencies from stations working in master-slave pairs. Position is indicated by two small meters in the cockpit, which are used to determine the plane's position with the help of a special chart.

UAC Ships $165 Million In First Quarter

United Aircraft Corp. earnings rose from $1.75 for the first quarter of last year to about $2.30 a share for the current year, including figures from Chance Vought, which is now a wholly owned subsidiary. If these earnings are not included, the current figure is reduced to $1.90 a common share.

Shipments by United Aircraft during the first quarter totaled about $165 million, or $203 million if the Chance Vought figure is included.

Stockholders See Model Of Douglas C-133

A preview of the new Douglas C-133 turboprop transport has been given stockholders attending the company's annual meeting in Santa Monica. The plane features a high wing, tail loading, and full pressurization of the cabin. It is powered by four P&W T34 turboprop engines. "Construction money" is expected from the Air Force very soon, according to Donald Douglas, Jr., who indicated that only development funds have been available up to now.

Unions Win Wage Boosts at Convair

Two unions at Convair's Fort Worth plant have won new contracts which provide for pay increases of five cents an hour and other benefits. The unions are Lodge 776 of the AFL-Machinists and Local 277 of the Office Employes International Union, representing 12,000 and 1150 employes, respectively, out of the Forth Worth total of 17,800.

The contracts grant the pay raise retroactive to last December 21. Also involved are increased payment by the firm of group insurance costs, a third week of vacation after 15 years, liberalized sick leave, and increases in the minimum and maximum pay for each labor grade.

TWA, NEA Report Losses in Quarter

Net losses have been reported for the first quarter of 1954 by TWA and Northeast Airlines. The TWA loss came to $3.97 million, compared with a loss of only $766,000 in the same period of 1953. Revenues were down slightly, reaching $39.5 million in 1954, but the carrier foresees record overseas travel this year. Tourist revenues were up 42%, reaching $14.8 million. TWA has more than 40,000 trans-Atlantic trips booked for the coming season.

The Northeast loss was also up sharply from that of the previous year's comparable period: $186,000 as compared with $5,500. Operating revenues rose $22,000, but operating expenses climbed $213,000 to reach totals of $1.67 million and $1.87 million, respectively.

Howard Named Head of Aero Training Society

Beverly E. (Bevo) Howard of Hawthorne School of Aeronautics, Moultrie, Ga., was elected president of the Aeronautical Training Society at its recent annual meeting. He succeeds E. Merritt Anderson of Malden, Mo., who is the new vice president. Wayne Weishaar was elected secretary-treasurer for his tenth term.

Directors elected include: Maxwell W. Balfour, Tulsa; John Cape, Hondo, Tex., Millard Davis, Atlanta; Fleetwood Garner, Bartow, Fla.; Frank Hulse, Birmingham; Major William F. Long, Dallas; Isabel McKay, Miami; Truman W. Miller, Kinston, N. C.; Clarence Page, Oklahoma City; S. J. Solomon, Columbus, Miss.; and Howard and Anderson.

Denmark Prepares for Air Force Shake-Up

Complete reorganization of the Danish Air Force is scheduled, with a "foreign expert of lieutenant general's rank" (probably from the RAF) assisting. British and American personnel in civilian clothes will also participate.

At the request of the Danish government, American officials of NATO recently studied the Danish Air Force. A high jet accident rate during the year just past prompted the request. A Danish wartime fighter ace, Colonel Birsksted, recently resigned as deputy commanding general in protest against the organization of the air force. He is now reportedly ready to act as special adviser in the shake-up.

Panair do Brasil Reports Profit in '53

The first net profit in several years has been reported by Panair do Brasil. The figure is set at the equivalent of $360,000 for calendar year 1953. Subsidies from the Brazilian government during the year totaled $2.88 million, wiping out an accumulated deficit of $1.35 million, plus the operating deficit that was experienced during the year.

Trans Caribbean Buys DC-6 from Panagra

Purchase of a 60-passenger Douglas DC-6 from Panagra has been confirmed by Trans Caribbean Airways. The transaction reportedly involved "more than $1,000,000 cash." The aircraft will be used between New York and Puerto Rico, and between other points in the U.S. The purchase is not expected to effect the purchase of two Vickers Viscounts, which is now being considered by the carrier.

Taylorcraft Planning Argentine Factory

Taylorcraft, Inc., is negotiating to set up manufacturing facilities in Argentina, where it would produce 200 lightplanes per year. Plans call for production of 100 aircraft the first year, mainly two-place Taylorcraft trainers with 90-hp Continental engines.

Taylorcraft would invest $500,000, and Argentine businessmen would participate; no financial investment would come from the Argentine government.

Commercial Rights Tie-up ICAO Conference

STRASBOURG, FRANCE—The ICAO convened conference on the co-ordination of air transport in Europe has reached a deadlock on the main problem of the exchange of commercial rights in Europe, according to AMERICAN AVIATION'S Paris Editor, Jean-Marie Riche. The Scandinavian countries consider that a multilateral agreement should replace the existing 120 and the potential 170 European bilateral agreements. France favors agreement between operators on specified routes. The Netherlands is strongly in favor of interchange of routes.

On the other hand, Britain urges retention of the present bilateral system but the removal by multilateral agreement of the distinction between Third, Fourth, and Fifth Freedoms. Germany tends to support the British view, while Italy likes portions of the British, French, and Dutch proposals.

Hiller Reduces Helicopter Price

A price reduction for the Hiller 12-B helicopter, from $36,000 to $33,400, has been announced by the firm. The lower price will apply to a modified version of the 3-place rotocraft, which will not include such features as dual controls, night flying equipment, and cabin heater. Recent deliveries of six Hiller 12-B's have been announced.

Bell Aircraft Net Up 96% Over 1953

Due at least partially to lower 1954 tax rates, Bell Aircraft's net profit for the three months ended April 3 was up 96% over the comparable 1953 figure. The net was reported as $1.7 million, as compared with $867,000 for the year before. Sales were up 29.1% for a total of $45 million. Backlog on April 3: $450 million.

V-loan bank borrowings were at their lowest since December 1950, reaching $11 million by the end of the quarter and dropping to $9.5 million after that date.

Cobb Moves to American

James H. Cobb has joined American Airlines as director of advertising. He left Delta—C&S to take the new post, having been vice president of advertising and public relations for that carrier.

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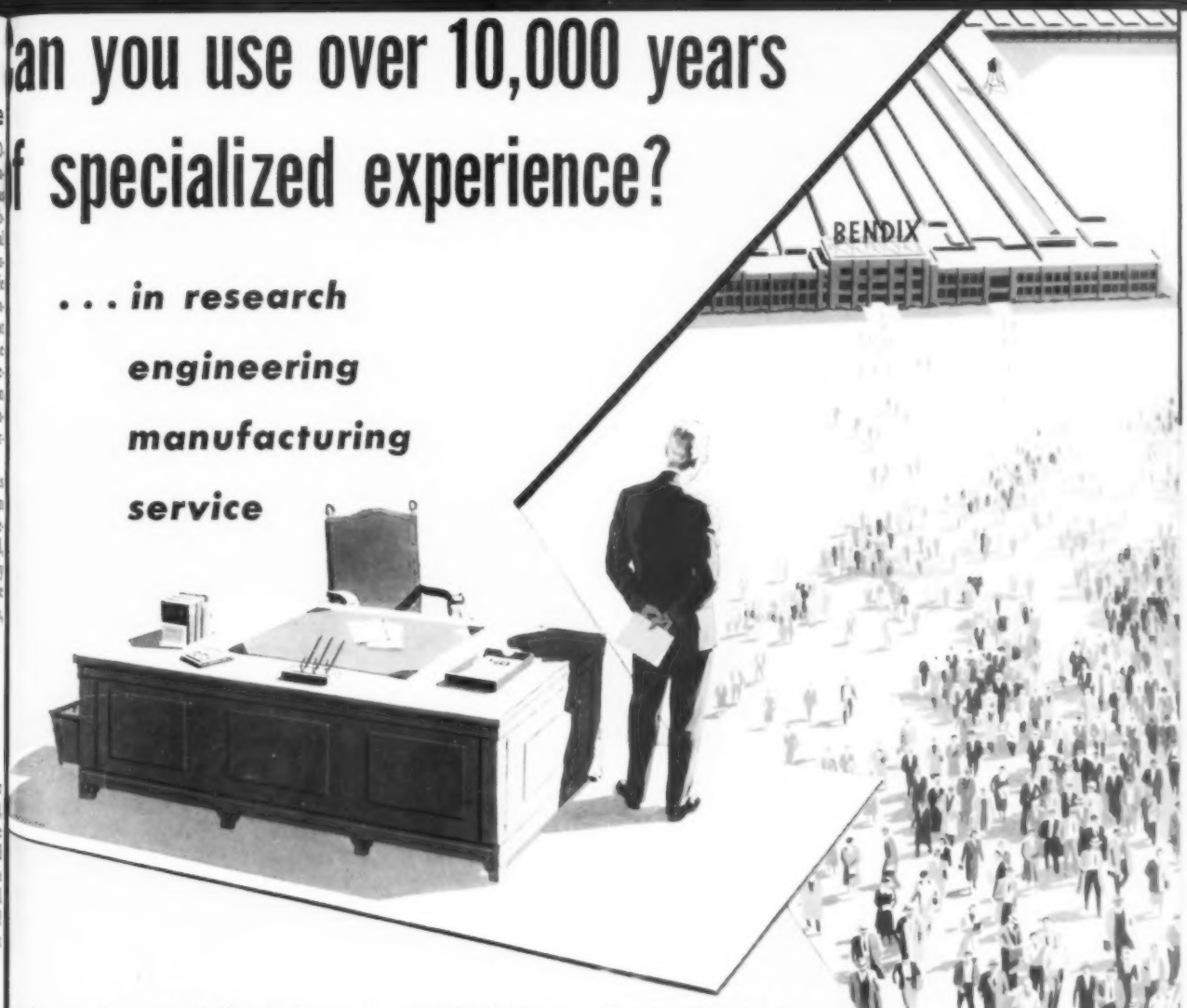

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